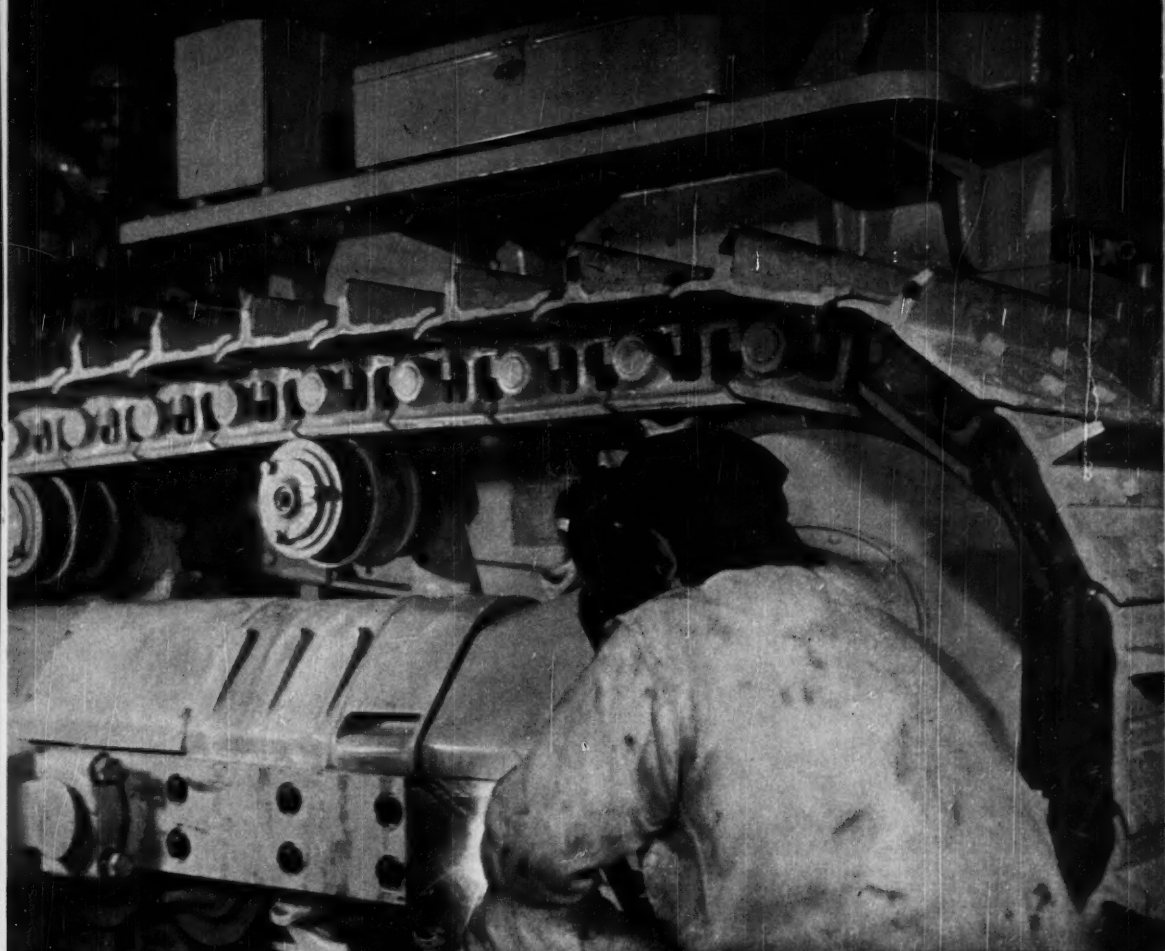


# CONSTRUCTION

## METHODS AND EQUIPMENT

July 1950



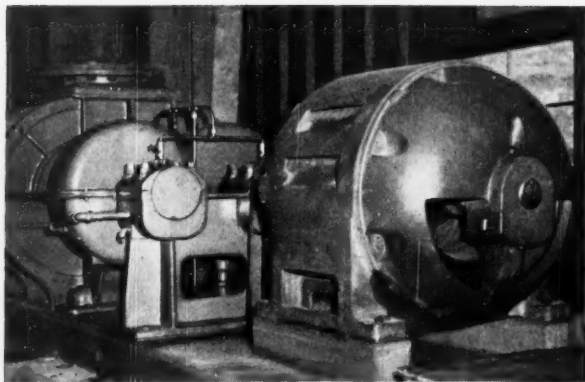
**Preventive Maintenance Pays Off**

A MCGRAW-HILL PUBLICATION

Ventilation for the Delaware Aqueduct tunnel is provided by blowers driven by sturdy G-E 200-hp induction motors.



▲ Muck is efficiently hauled by 18 G-E battery and battery-trolley locomotives.



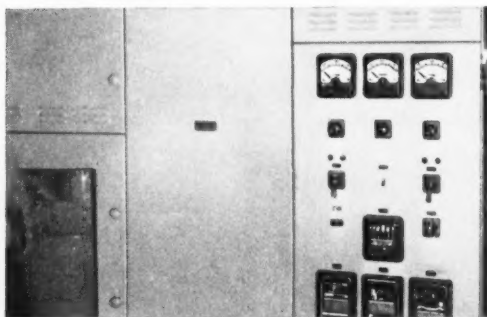
## tunneling through the CATSKILLS

*...Electrically*

to bring more water to New York City

Adding 300 million gallons a day to New York City's water supply is a big job no matter how it's done. To help bring it from the Delaware River, the Walsh Construction Co. and B. Perini and Sons must bore 25 miles through the Catskill Mountains. At about 70 feet a day, they've still a long way to go, but expect to complete the job around July 1955 with *electricified* equipment co-ordinated and engineered by General Electric.

Every day, more contractors are looking to reliable *electricified* equipment for flexibility, safety, and ease of maintenance. With equipment driven by G-E motors and control, and supplied from G-E power distribution systems they get modern *electric drives* with the added advantages of G-E engineering assistance in application, installation and service. *Apparatus Dept., General Electric Company, Schenectady 5, N. Y.*



▲ Adequate d-c power for trolley service is obtained from eight G-E 150-KW stationary mine-type mercury-arc rectifiers specially designed for this project.

*Ask him Today!*

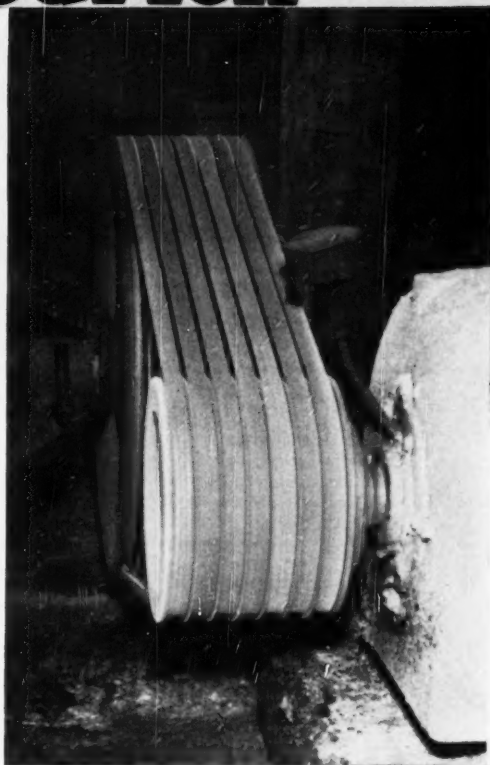
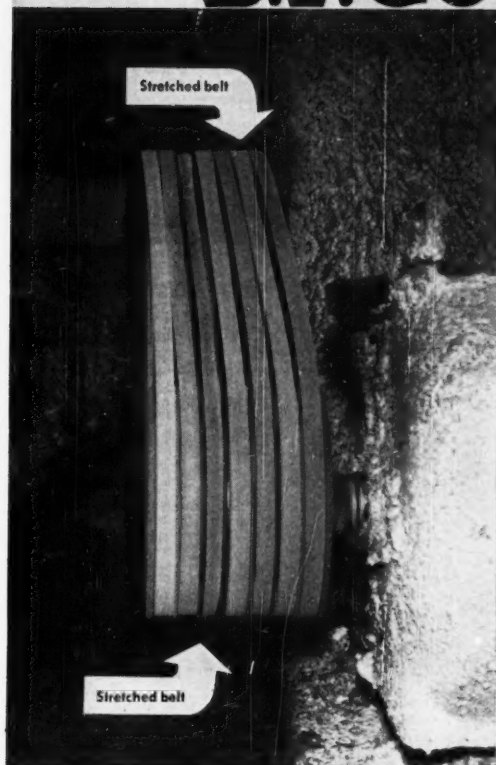
Whether you buy or build construction equipment, your G-E representative can show you how to do a better job—at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.

GENERAL  ELECTRIC

*Electricified  
Construction*  
BETTER PRODUCT  
LOWER COST



# B.F. Goodrich



## One of these drives is wasting money — the other has grommet V belts

*B.F. Goodrich grommet V belts cut costs 20 to 50%*

**B**OTH of these drives are in the same plant, do the same work, get the same maintenance. When first installed both were equipped with ordinary belts. But within a few days the belts had stretched so much the motor had been moved to the end of the slide rails. Ordinary belts were tried again, but they still stretched, even more so. The photo at left shows how the belts looked — loose, permanently stretched, over-riding each other.

Then B.F. Goodrich grommet V belts were put on both drives. After six months of 24-hour-a-day service, they haven't stretched at all, as the photo at right shows. Here are the reasons:

**Twin grommets** — The B.F. Goodrich grommet is made by winding heavy

cord upon itself to form an endless loop. These grommets are placed close to the driving faces of the belt, make up the load-carrying section. No fabric plies to stiffen and build up heat. The B.F. Goodrich grommet V belt is more elastic, has less permanent stretch than any other V belt.

**Grommets work all the time** — In an ordinary belt much of the cord strength is lost, wasted in the center of the belt where the cords don't pull their share of the load. But in the grommet belt there are no center cords to loaf. The grommets do the work, stay at it all the time.

**Grommets last longer** — Laboratory and field tests show grommet V belts last 20 to 50% longer. Cause

of most belt failures is eliminated by the grommets that replace overlapping cord plies.

The twin grommet construction is a result of B.F. Goodrich research (U.S. Patent No. 2,233,294). No other V belt is a grommet V belt. Presently made in D and E sections only.

A special demonstrator "X-ray" belt has been made to show the grommet construction. Ask your local BFG distributor to bring it around. *The B.F. Goodrich Company, Industrial and General Products Division, Akron, O.*

*Grommet V Belts* **BY**  
**B.F. Goodrich**

# 13

## is your lucky number ONLY WHEN YOU PROTECT YOUR ENGINE WITH WINSLOW FILTERS

### 1 REMOVE ACIDS

by special neutralizing agents.



### 3 TRIPLE SAFETY

Patented rupture-proof double covering; element materials harmless to engine; additives unchanged in compounded oils.



### 5 TOP EFFICIENCY

Channels narrow toward center, stop larger particles first, smaller ones later, hold them all.



### 7 LONGER LIFE

Element fibers absorb impurities, straighten out, keep channels open for longer use.



### 9 RIGHT SIZE

Winslow Filters for all sizes of engines.



### 11 ELEMENTS FOR ALL

standard makes of filters.



### 2 STOP MOISTURE

at water-repellent surface, absorb residue in element fibers.



### 4 TRAP ABRASIVES

such as gritty carbon, dust, or metal particles.



### 6 FREE FLOW

Entire outside surface filters oil; spring coil core maintains free flow.



### 8 ELEMENTS HOLD DIRT

twice, triple, quadruple their original weight.



### 10 FULL-FLOW

Filters all the oil oftener, cleaner.



### 12 ENGINEERING SERVICE

to meet special filtration problems.



**13 DISTRIBUTORS AND DEALERS** throughout the United States, Canada, in foreign nations, offer convenient service.



DETAILS? Gladly. Just write to:

## WINSLOW FILTERS

Winslow Engineering Company

4069 Hollis Street • Oakland 8, California

**For Faster, Cleaner, On-the-Job Lubrication**

# DESIGN YOUR OWN PORTABLE LUBRICATION DEPARTMENT

*or specify a* **Lincoln**  
**Standard LUBROVAN\***

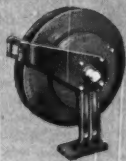


## AIR-MOTOR OPERATED DRUM PUMP ASSEMBLIES

Air-motor Operated, High Pressure 400-lb. Drum Pump — 40:1 Ratio, complete with Drum Cover, Tie Rod Assembly, and Hose.

## SPRING ACTUATED HOSE REELS

Accommodate up to 40 ft. of delivery hose. May be operated singly or in batteries. Counter-balanced action permits smooth, easy withdrawal of hose, and uniform speed of return.



## Select Complete Lincoln Power Operated Drum Pump and Reel Assemblies to Meet Your Specific Needs

Lincoln portable Lubrovans\* for on-the-job lubrication may be assembled in any combination of drum pumps and reels for dispensing chassis, trac-roll, gear lubricants and motor oil to meet your specific lubrication requirements.

This compact, ruggedly constructed equipment reduces lubrication time to a minimum — eliminates contamination and waste of lubricants — and makes it possible to keep equipment properly serviced at all times, thereby avoiding costly breakdowns, wear and loss of productive time.

With a Lincoln Lubrovan, no matter how far afield your equipment is working, every machine is assured faster, more efficient lubrication, at lower cost.

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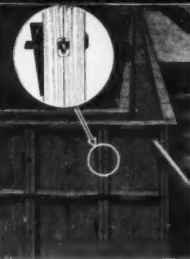


Write for your copy of Lincoln's New Catalog No. 30 illustrating portable Heavy Duty Lubricating Systems for Contractors.



**LINCOLN ENGINEERING COMPANY** 5702-19 Natural Bridge Ave., St. Louis 20, Mo.

# SYMONS CONCRETE FORMS



Your  
answer

to

## low foundation costs

Here's Why!

Symons Concrete forms save you 50 to 75% of the entire labor of forming. You eliminate eleven costly steps in concrete form construction, and the following materials:

- ✓ Nails
- ✓ Lumber for more than one waler
- ✓ Most of the lumber for bracing
- ✓ Loss of lumber caused by the splitting action of nails
- ✓ Spreaders

These forms can be built in your own shop . . . saving you freight . . . or you may purchase the forms complete.

Inset shows head on view of tie.

At left is cross section view of tie.

## SAFETY SHORES and "Ever-Square" COLUMN CLAMPS

... the builders choice



**COLUMN CLAMPS** . . . Have only two units . . . both alike. No loose parts. Simple to put on—only tool required is a hammer. The only clamp known that will positively square up the column. Adjustable.

**SAFETY SHORES** . . . Lighter, stronger, easier to adjust and safer to use. Symons Shores have many exclusive features . . . metal scab, powerful lifting jack, simple and secure tee head and an extension for very high ceilings. Compare the Symons Shores with other shores and you will be convinced of their superiority. Symons Forms, Safety Shores and Column Clamps can be rented with purchase option. Paid rentals apply on purchase price.

**SYMONS CLAMP & MFG. CO.**  
4255 West Diversy Ave., Chicago 39, Ill.

Please send information regarding

☐ Forms ☐ Column Clamps ☐ Shores

Name

Address

City  Zone  State

Volume 32  
Number 7

# CONSTRUCTION METHODS AND EQUIPMENT

ESTABLISHED  
1919



Member



JULY 1950

## Pay Dirt in This Issue

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## Good Advice From the Manufacturer

Experts tell why a sound, regular program of preventive maintenance is essential for efficient and profitable mechanized operations. And they show how to apply that program to the following equipment:

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**ON THE COVER**—Clever Hank Killion, shop superintendent for H. O. Penn Machinery Co., Inc., big New York City distributor, has a lot of ideas about preventive maintenance. One of his ideas is shown on our front cover this month. Before sending out a new Cat D8 tractor equipped with a bulldozer, Hank welds a triangular kick plate on each side of the tractor frame to take the end thrust of the bulldozer trunnions. The plates relieve the trunnion bolts of much shear stress and keep the bolt holes from wearing out of round.

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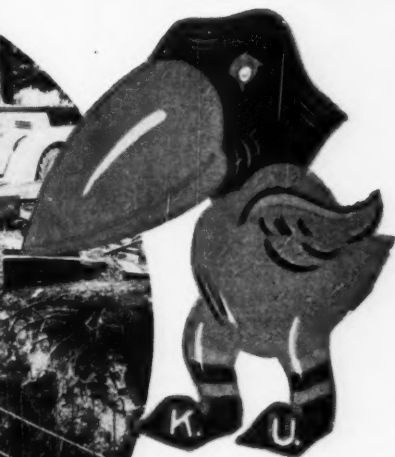
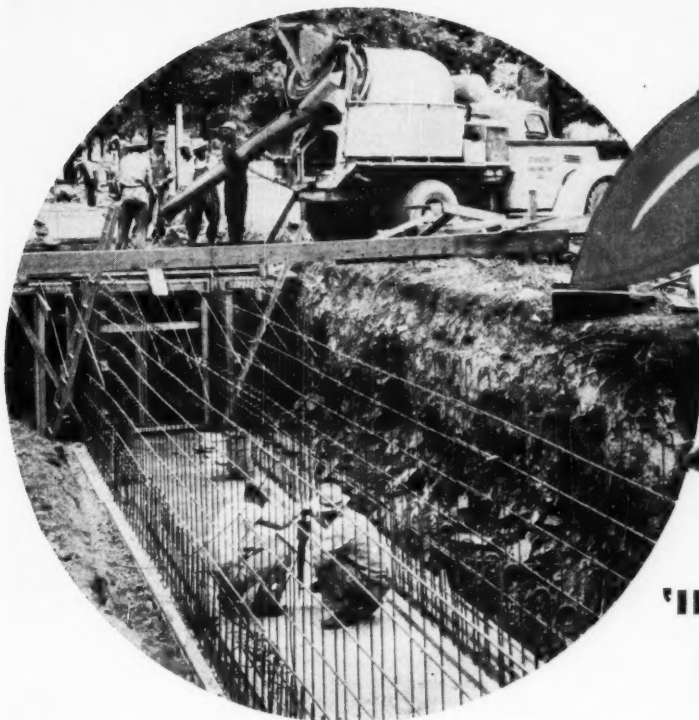
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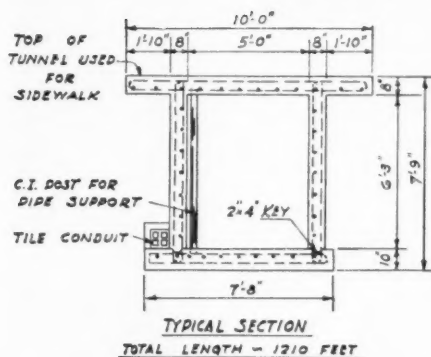
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# Sidewalk-Top Heat Tunnel...



## 'INCOR' HALVES FORM COSTS



**Problem:** How to transmit heat from central plant to new buildings without pipe trenches disfiguring Jayhawkers campus at University of Kansas.

**Solution:** Heating tunnel under sidewalks...concreted with 'Incor'\* 24-Hour Cement. Concrete placed one day...forms stripped and re-used the next...one form-set instead of the two or three needed for equal speed with ordinary cement.

**Result:** On-time completion, bone-dry tunnel, good-looking sidewalk job—everybody pleased!

Typical time-and-money-saving performance of America's FIRST high-early-strength Portland Cement.

\* Reg. U.S. Pat. Off.

HEATING TUNNEL, UNIVERSITY OF KANSAS, Lawrence  
Architect: **CHARLES L. MARSHALL**, State Architect Topeka  
Contractor: **CONSTANT CONSTRUCTION CO.**, Lawrence  
Ready-Mix 'Incor' Concrete: **THE READY-MIX CO.**, Lawrence

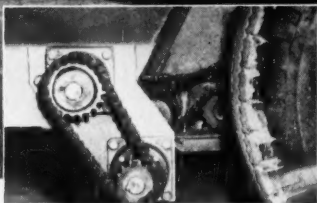
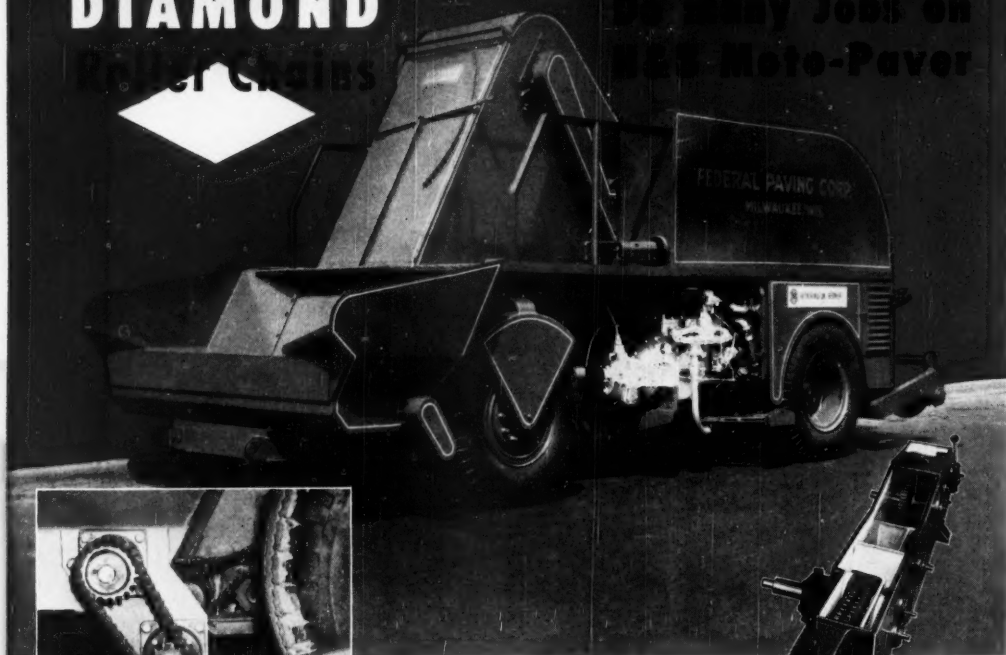


## LONE STAR CEMENT CORPORATION

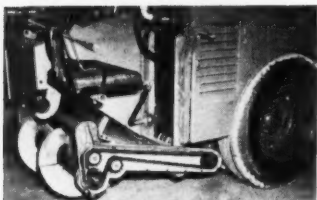
Offices: ALBANY • BETHLEHEM, PA. • BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS • JACKSON, MISS. • KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK • PHILADELPHIA • ST. LOUIS • WASHINGTON, D. C.  
LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 27,500,000 BARRELS ANNUAL CAPACITY

# DIAMOND Roller Chains

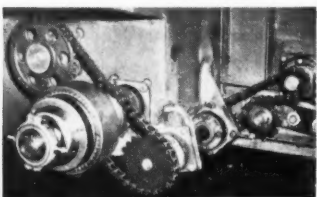
## Do Many Jobs on New Moto-Paver



Hopper Screw Drive

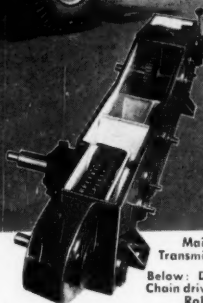
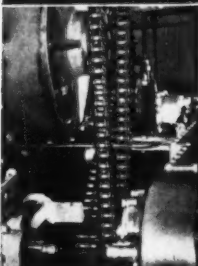


Diamond Chains for distributing Screw

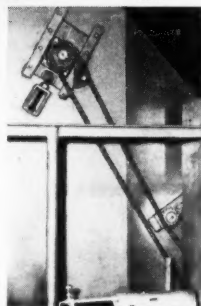


Above: Hopper  
Belt Drives.

Diamond Mixer  
and Feeder  
Drives.



Main  
Transmission  
Below: Diamond  
Chain drives Feed  
Roll.



Elevator Drive



● Present day road and construction work requires machinery of high steady output,—machinery that is rugged, reliable and efficient.

On leading makes of machinery of this kind, like the Hetherington & Berner Moto-Paver, Diamond Roller Chains are used extensively because of their great reserve strength and long-life dependability. Six of these drives and the transmission are shown.

Such drives transfer power without slip or waste, and also give the engineer designer wide latitude in placement of shafts,—since center distances present no problem.

In laying out new equipment you, too, will find Diamond Chains will expedite design and manufacture, as well as assure maximum performance.

DIAMOND CHAIN COMPANY, Inc.,  
Dept. 418, 402 Kentucky Avenue, Indianapolis 7, Indiana.

Offices and Distributors in All Principal Cities

Refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

# DIAMOND ROLLER CHAINS



*It's on the Record..*

**"EUCLIDS**

**Haul More Loads  
At Less Cost!"**

Take the word of men who have learned from experience—" 'Eucs' sure get the jobs done—and at lowest cost, too!" Engineered and built for heavy off-the-highway hauling service, "Eucs" are standard equipment in many leading open pit mining and quarry operations, and on construction and industrial work.

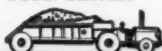
Owners depend on Euclids for staying power and continuous operation on jobs where schedules must be met . . . for low-cost production, long life and job profits.

The parts and service facilities of Euclid's world-wide distributor organization assure prompt, efficient service to Euclid owners everywhere. Consult your Euclid Distributor today for complete information on the Euclid line for off-the-highway hauling work.

**The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio**  
CABLE ADDRESS: YUKLID CODE: BENTLEY



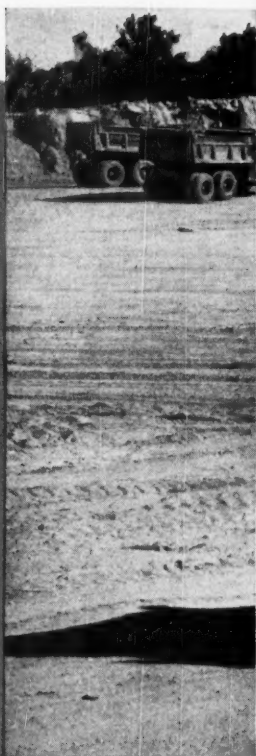
**EUCLIDS**



*Move the Earth*



# DIRT SEALED OUT! BEARINGS LAST LONGER



**... when  
lubricated with  
TEXACO MARFAK**

Dust, mud, moisture—they can't get into bearings protected with tough, tenacious *Texaco Marfak*! Protection is twofold. Inside the bearings, *Texaco Marfak* maintains a fluid, wear-resisting, lubricating film. At the bearing edges, it retains its original consistency — forming a "collar" that seals the lubricant in, seals contaminants out.

*Texaco Marfak* affords protection against rust and wear . . . assures fewer repairs and replacements . . . reduces maintenance costs. In addi-



# TEXACO





tion, *Texaco Marfak* far outlasts ordinary chassis grease. Fewer applications are needed.

In wheel bearings, you get this same cost-saving protection by using *Texaco Marfak Heavy Duty*. Bearings last longer... and its self-sealing property assures safer braking. No seasonal change is required.

#### Two other maintenance savings

Upkeep costs for engines — heavy-duty gasoline or Diesel — come down when you lubricate with *Texaco Ursa Oil X\*\**. It cleans as it lubricates...

helps reduce fuel consumption.

Crawler track mechanisms run better, last longer and cost less for maintenance when lubricated with *Texaco Track Roll Lubricant*. It seals dirt and moisture out of bearings even under severe conditions.

Find out how Texaco top-quality lubricants and the Texaco Simplified Lubrication Plan can help your machinery do more work at lower cost.

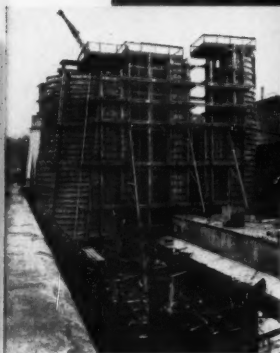
Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

**MORE  
THAN 350  
MILLION  
POUNDS OF  
MARFAK  
HAVE BEEN  
SOLD!**

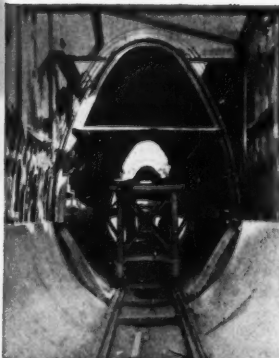
## Lubricants and Fuels

**FOR ALL CONTRACTORS' EQUIPMENT**

Blaw-Knox Steel Form on west end of Elkhorn double track tunnel near Coaldale, W. Va. This form has made over 50 moves, covering 2300 ft. Average pour 450 yds. in 45' sections. Each of the two forms used could be moved and set up for the next pour in 3 hours. A concrete finisher was never used on the job.



Typical of the wide variety of work handled by Blaw-Knox Steel Forms, the locks shown above are being built with Blaw-Knox Pier Forms. Below, a large sewer being constructed with Blaw-Knox adjustable forms.



## "OF COURSE WE USE BLAW-KNOX STEEL FORMS!

They slash concrete placing costs, and we can depend on Blaw-Knox *engineering experience* to help us solve tough or unusual problems."

"Bob" Parker,  
Haley, Chisholm & Morris  
Charlottesville, Va.

BOB PARKER has used Blaw-Knox Steel Forms for many years on his big construction jobs. He's had such success, satisfaction and economy that "of course" he chose them again for the Elkhorn tunnel on the Norfolk & Western R.R., the second double track tunnel the company has built since 1947 with Blaw-Knox Steel Forms.

When Bob is faced with a tough or unusual concreting problem, he never hesitates to call on Blaw-Knox for the engineering service that helps him save time, eliminate costly and unnecessary operations. Backed by more than 40 years' experience as the original and most prominent maker of Steel Forms for heavy construction, Blaw-Knox can help you by recommending the most efficient forms for your job and the most simplified, time and money-saving forming methods. This Blaw-Knox consultation service is available to any contractor for planning profitable construction jobs as early as the blue print stage.

WRITE FOR BULLETIN 2035 TODAY — Get experienced information on your job without obligation.

# BLAW-KNOX

BLAW-KNOX DIVISION OF BLAW-KNOX CO., Farmers Bank Bldg., Pittsburgh 22, Pa.  
New York • Chicago • Philadelphia • Birmingham • Washington



# THIS SHOVEL HAS STOOD *the Rock Test!*

Here's a job that would test the metal of any equipment. It's the kind of a place where smoothness of dipper control, ease of operation, accuracy in spotting and crawler maneuverability mean the difference between daily loss and irritation — or profit. Only a real Rock Shovel can handle a job like this! The machine is owned by Frazier-Davis Construction Co. of St. Louis, Mo., and it is working on part of the new water line for New York City — and by the way, Frazier-Davis have bought their 21st Northwest.

**CAN YOURS?**



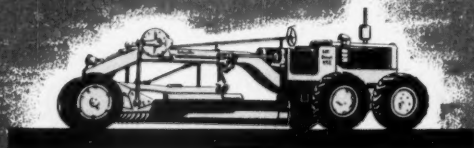
**NORTHWEST ENGINEERING CO.**  
1503 Field Bldg., 135 South LaSalle St.  
Chicago 3, Illinois



# NORTHWEST

# *Buy balanced*

## FOR MORE WORK



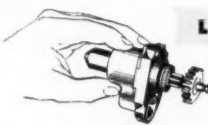
**SPEED  
WEIGHT  
POWER**

THE OWNER of the "Cat" No. 212 Grader shown here has a unique problem. "Can't keep operators away from the rig," says D. W. Klock, vice president of the Klock Construction Company, Amarillo, Texas. "This Motor Grader is so fast, maneuverable and well balanced, the boys *all* want to run it!"

Balance is the secret of "Cat" Graders' popularity with owner and operator alike. "Caterpillar" builds each Motor Grader from the ground up as an individual unit. The correct weight, plus the right horsepower, plus rated work speed—these things add up to *balanced* machines that solve your job problems at lower cost.

Informed buyers are finding that *assembled* motor graders are often poorly balanced. It stands to reason that when one engine or one frame is used for more than one model, the best use cannot be made of weight and power. But balanced "Cat" rigs are neither muscle-bound nor jumpy on the job. Their matching power cuts costs through superior performance and longer service life.

There's a size "Cat" Motor Grader for every type of work—with the stamina, punch and balance to do a particular job best. And don't forget what world-famous "Caterpillar" dealer service means in keeping equipment on the job—cutting down-time to the bone. Ask your "Caterpillar" dealer to show you his Motor Graders' bonus features—from tough blades with the maneuverability of a boarding-house reach, to "Hi-Electro" hardened final drive gears built to last.



### LOOK UNDER THE HIDE

Fuel pumps are "Caterpillar"-designed and "Caterpillar"-built.

Made of the cleanest high-chromium, high-carbon alloy steel obtainable, the pump plungers and barrels are diamond lapped. Pumps are heat-treated to maximum hardness to give users thousands of hours of trouble-free economical service. There is an individual pump for each cylinder. Pumps are adjustment-free and completely interchangeable. Look under the hide for quality—it doesn't show on the outside, it shows up in performance.

# CATERPILLAR

REG. U.S. PAT. OFF.



# "Cat" graders

## AT LESS COST

Here's the Klock Construction Company's "Cat" No. 212 Grader working on the new municipal football stadium in Amarillo. Does subgrade, shoulder work and drainage. It's punched the Klock Co.'s time clock for 5186 hours of work. D. W. Klock says, "This 'Cat' No. 212 Grader is the backbone of our street, alley and parking area work in the city of Amarillo. It's especially well balanced, and just the right size for our work. Small enough to work in close places, but powerful enough for big production—and fast getting from one job to another. Going to buy another just like it this year!"



### NO. 12

In a No. 12 "Cat" Motor Grader you get a No. 12 from stem to gudgeon. The "Cat" Engine was built for a frame that gets full use out of its 100 hp. And the working speed range was engineered to get maximum production at each speed.

|             |             |
|-------------|-------------|
| WEIGHT      | 22,200 lbs. |
| ENGINE      | 100 hp.     |
| SPEEDS: 1st | 2.3 mph.    |
| 2nd         | 3.6 "       |
| 3rd         | 5.5 "       |
| 4th         | 8.5 "       |
| 5th         | 12.0 "      |
| 6th         | 19.3 "      |
| 1st R.      | 2.7 "       |
| 2nd R.      | 4.1 "       |

Price of the standard model No. 12 is \$10,920.  
f. o. b. Peoria, subject to change without notice.

### NO. 112

With the No. 112 you get the No. 112's 75 hp. Engine on a No. 112 frame, with a No. 112 weight and a No. 112 transmission. You don't get mismatched power, weight or speed.

|             |             |
|-------------|-------------|
| WEIGHT      | 19,330 lbs. |
| ENGINE      | 75 hp.      |
| SPEEDS: 1st | 2.1 mph.    |
| 2nd         | 3.0 "       |
| 3rd         | 4.0 "       |
| 4th         | 5.6 "       |
| 5th         | 11.2 "      |
| 6th         | 16.0 "      |
| 1st R.      | 2.8 "       |
| 2nd R.      | 4.0 "       |

Price of the standard model No. 112 is \$9545.  
f. o. b. Peoria, subject to change without notice.

### NO. 212

When you buy a No. 212 you get the same balanced performance. It has its own weight, its own frame, its own "Cat" Engine, its own working speeds.

|                      |             |
|----------------------|-------------|
| WEIGHT: tandem drive | 13,290 lbs. |
| single drive         | 11,010 "    |
| ENGINE               | 90 hp.      |
| SPEEDS: 1st          | 2.0 mph.    |
| 2nd                  | 3.1 "       |
| 3rd                  | 4.9 "       |
| 4th                  | 11.9 "      |
| R.                   | 2.8 "       |

Price of the standard model No. 212 is \$6435.  
f. o. b. Peoria, subject to change without notice.

**DIESEL ENGINES • TRACTORS  
MOTOR GRADERS  
EARTHMOVING EQUIPMENT**

**CATERPILLAR, PEORIA, ILLINOIS**  
R.R. U.S. PAT. OFF.



THE DEMPSTER-DIGGSTER, Type GRD, same as the one that loaded 600 tons of stone recently, has a 15 foot six inch turning radius, is 20 feet long when bucket is in traveling position, and bottom of bucket

is nine feet three inches above ground when in extreme dumping position. It will dig 15 inches below grade and through a 15 foot bank.



THIS DEMPSTER-DIGGSTER, Type HL, is specially equipped for high dumping. The bottom of the bucket is 13 feet six inches above ground. It will dig through an 18 foot bank.



FOR FAST, EFFICIENT operation in difficult terrain, the Dempster-Diggster is available with crawler-type traction.

## Fast Automotive Shovel Loads 600 Tons of Stone in Half a Day

**CONTRACTOR REPORTS: HYDRAULIC CROWD, HOIST UNIT "FILLS LONG NEEDED PLACE IN OUR INDUSTRY"**

THE DEMPSTER-DIGGSTER, a revolutionary shovel loader, recently loaded 600 tons of broken stone in the first half day of operation. This outstanding performance was reported to Dempster Brothers, Inc. by W. E. Lambert, president of Lambert Brothers, Inc., one of the nation's largest crushed stone contracting firms.

"In connection with our extensive activities in several southern states," the contractor said, "we have used various types of power shovels and front end loaders. After seeing the easy operation of the hydraulically operated Diggster in a demonstration we had made alongside of a competing loader, we placed an order with you. We installed the Diggster equipped with a yard and half stockpile bucket on one of our operations in western North Carolina.

"Our records show," he continued, "that the unit loaded approximately 600 tons of broken stone in the first half day of operation. The Diggster has been working continuously and is giving perfect satisfaction. It is a pleasure for us to so advise you because in our opinion the Diggster fills a long needed place in our industry. We welcome you to bring

any interested parties to our operation to see the Diggster in action."

The tremendous speed of the Dempster-Diggster in excavation and stockpile work is accounted for, mainly, by its exclusive independent hydraulic crowd and hoist action, the hydraulic steering, and wheel-type traction, which permits truck speeds to and from jobs. The power crowd permits bucket to keep digging until loaded . . . no digging with wheels. The hydraulic steering gives the driver easy, fast, finger-tip control.

Four standard interchangeable buckets of two types are available. Digging buckets with four bottom teeth in 1 and 1½ cubic yard (heaped) capacities; materials handling buckets in 1½ and 2 cubic yard (struck) capacities.

Complete information and prices may be obtained by writing the manufacturer, Dempster Brothers, Inc.

**DEMPSTER  
DIGGSTER**

**DEMPSTER BROTHERS**  
370 SHEA BUILDING  
KNOXVILLE 17, TENNESSEE

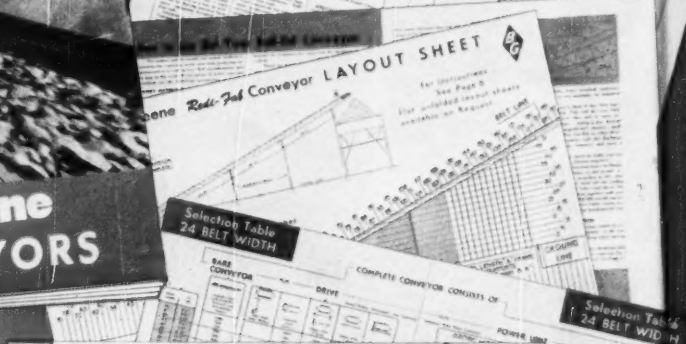
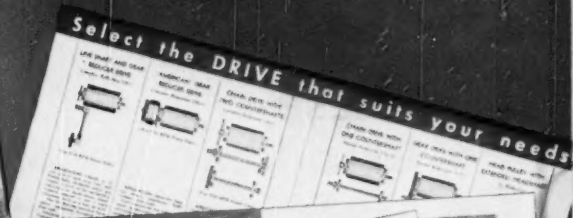
# Barber-Greene

NEW BOOK PRESENTS THE

*Redi-Fab*

SERIES

a new, practical, simplified  
conception of belt conveyors



## Send for Your Copy

Here in this new 40-page catalog Barber-Greene presents the Redi-Fab series of belt conveyors—in a manner that completely unmask the mysteries of conveyor selection and application.

An entirely new concept of belt conveyor design, the Redi-Fab series enables you to get a belt conveyor quotation almost instantly—and delivery from stock.

And this new 40-page Redi-Fab catalog makes it possible for you to figure your own requirements if you wish. No knowledge of horsepower required: Your Redi-Fab Conveyor, which you can select from this catalog, will automatically have the correct size of drive and motor. In fact, with the new layout sheet in the Redi-Fab catalog you can make your own layout, right down to locating and selecting the "A" frame supports. These are just the high spots—fill in this coupon and get your copy at once.



*Use this coupon!*

To bring you one of this new catalog



Barber-Greene Company  
Aurora, Illinois, U.S.A.

( ) Send me my copy of the Redi-Fab Catalog.  
( ) Have a representative call.

Name .....

Firm Name .....

Address .....

City ..... State .....



**BARBER-GREENE**  
AURORA, ILLINOIS

*Constant Flow Equipment*

# Stop Grinding Holdups...

# Spot These Grinders On Your Jobs

**Why Hold Up Work**  
by waiting for tools or parts taken back to the shop for grinding... when you can keep jobs moving by spotting Black & Decker 6" Standard Bench Grinders on every job?

**At This Low Price**  
you can afford to have B&D 6" Standard Bench Grinders within easy reach of all your workers... to save time and cut tool maintenance costs.

**Speed Up** tool sharpening, "run - of - shop" grinding jobs, cleaning, burnishing, buffing!

**Many Practical Features** you wouldn't expect to find at such a low price... B&D-built 1/4 H.P. constant-speed motor; full-size ball bearings; steel wheel guards; adjustable tool rests locked in base grooves; new styling for better working clearances!

**See Your Nearby B&D Distributor** for details on 6" Standard Bench Grinders, other models for heavier duty, many accessories. Write for free catalog of over 100 Portable Electric Tools to: THE BLACK & DECKER MFG. CO., 659 Pennsylvania Ave., Towson 4, Maryland.

LEADING DISTRIBUTORS  EVERYWHERE SELL

## Black & Decker

PORTABLE ELECTRIC TOOLS



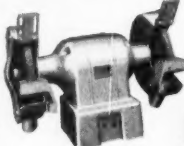
**Buy BLACK & DECKER—  
the Complete Bench Grinder Line!**



6" Heavy-Duty  
1 1/2 H.P. \$58



8" Heavy-Duty  
3/4 H.P. \$98



10" Bench Grinder  
1 H.P. \$138



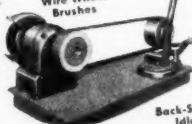
Whirlwind  
Wire Wheel  
Brushes



Illuminated  
Eye Shields



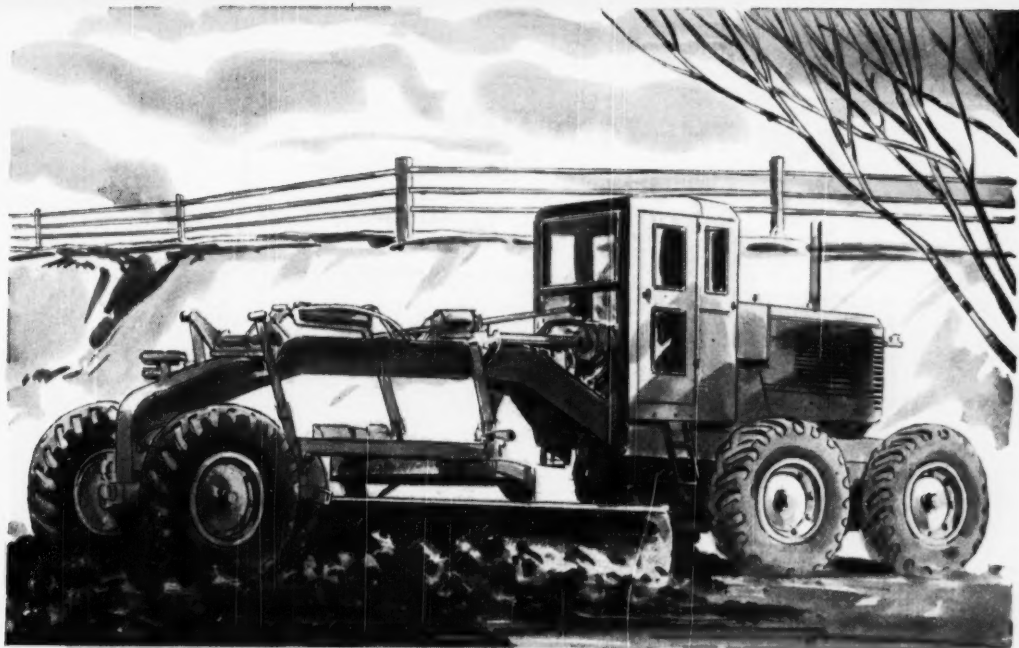
Grinder  
Pedestals



Back-Stand  
Idler

\*Trade Mark Reg.  
U. S. Pat. Off.





## road grader

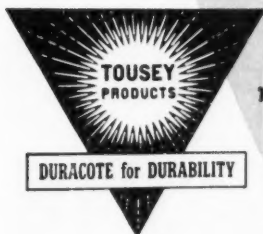
**O**NE of the larger and more expensive pieces of road machinery is the grader. Because of the initial investment, and because of the punishment it is subjected to—a good finish is important. A finish that will stand up under violent impacts, abrasion from sand and gravel, stains from road oil and extremes in temperature.

Such a finish has been developed by Tousey and is being used successfully by manufacturers of industrial equipment.

If you have a finishing problem—call Tousey.



"65 YEARS OF ACHIEVEMENT,"  
our new book, tells the story behind Tousey's  
paints, lacquers and varnishes.  
You'll find it interesting reading. A postal  
card or letter will bring you a  
copy with no obligation



**TOUSEY FINISHES CAN TAKE IT!**

**TOUSEY VARNISH CO.**

Member of:



520 WEST 25TH STREET, CHICAGO 16, ILLINOIS

**FOR THE 14th TIME**  
 Farnsworth and Chambers, Inc., Houston, Texas  
 works **"IN THE DRY"** with MORETRENCH!



Official Photo — New Orleans District, Corps of Engineers

Again and again this well known contracting firm selects Moretrench Wellpoint Equipment.

Shown above is one of the Farnsworth and Chambers jobs — *completed eleven months ahead of schedule*. It is the WEST CALUMET FLOODGATE, near Patterson, Louisiana, where Moretrench Wellpoints controlled 18 feet of water in fine silty sand.

Progress and profit on a wet job frequently depend on *how* you pump it. That's why experienced contractors depend on Moretrench Equipment and Moretrench know-how for quick, economical predraining on every type of wet project.

Write, wire, phone our nearest office  
 for help on your pumping problem.

## MORETRENCH CORPORATION

90 West St.  
 New York 6


4900 S. Austin Ave.  
 Chicago 38, Illinois

7701 Interbay Blvd.  
 Tampa 9, Florida

315 W. 25th St.  
 Houston 8, Texas

Rockaway  
 New Jersey

# YOU CAN PILE UP YARDAGE FASTER and at LOWER COST with **Firestone TIRES**



**IT'S THE MOVING UNIT** that piles up the yardage . . . The idle unit piles up expense!

**YOU CAN KEEP YOUR UNITS MOVING** more hours on the job with Firestone Tires. You can pile up more yardage in less time because Firestone tires stand up under a greater amount of punishment . . . keep going over a longer period of time.

**FIRESTONE TIRES** cost you no more than ordinary tires . . . cost a lot less than the downtime you have with other tires.

**TRY THEM** and you'll find that for dependability . . . for durability . . . for all-out performance and downright value, you just can't match Firestone Tires.

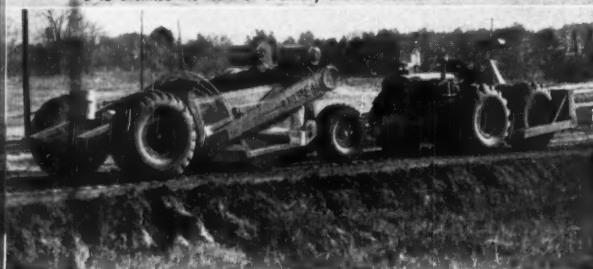
*Listen to the Voice of Firestone  
every Monday evening over NBC*

Copyright, 1950, The Firestone Tire & Rubber Co.

**WHEN YOU BUY NEW EQUIPMENT**  
*Specify* **Firestone TIRES**

# Get more jobs done

**MORE THAN DOUBLES DOZER OUTPUT** . . . Over twice as fast with load . . . instantaneous "no-shift" gear selection lets Tournadozer drift load at high-rolling speeds. Big, 11' 2" x 43" Bulldozer blade carries up to 2 1/2 yards each trip. High-speed reverse cuts cycle time in half. Runs, instead of crawls . . . does 2 to 3 times the work of ordinary crawler-dozers.



**HAULS SCRAPERS** . . . Tournadozer's faster power makes it a big-yardage prime mover for use with 4-wheel scrapers. Quickly coupled to drawbar of 13.5-yard, electric-control E-16 Carryall . . . or hooked up to the cable-operated LS Carryall . . . it's the fastest loading, hauling, spreading tractor-scraper combination you've ever seen!

**LIFTS TO 14 TONS** with side-boom Crane. Has 12' lifting height . . . 12' reach . . . lifts 5 tons in maximum reach position, 14 tons with boom raised. Finger-tip electric controlled. Manuevers, spots on a "dime" . . . works, travels anywhere . . . carries load over pavement, through mud. Saves money on your jobs . . . earns good pay on sub-contracts or rentals.



**TOWS SHEEPSFOOT ROLLERS** . . . Tournadozer's 180 "horses" and 4-wheel drive give plenty of power and traction for pulling single or multiple Sheepfoot Rollers. Heavy Tournapacker, illustrated, has up to 1100 lbs.-per-square-inch ground bearing pressure. Tournadozer's giant 21.00 x 25 low-pressure tires add to compaction without tearing up fill surface.

**PULLS WITH 50,000# LOGGING WINCH** . . . the Tournaskidder . . . an unusual combination of Bulldozer and Winch, puts both ends of Tournadozer to profitable use. Bulldozer with special A-frame mounts on front . . . heavy-duty Winch develops 50,000-lb. line pull for skidding pipe, snaking logs, etc. Plenty of power for any winch application . . . makes either end equally productive.



**ROOTS HARD MATERIALS** . . . With handy hookup to rear cable PCU, versatile Tournadozer is ready for Rooter service. Plenty of drawbar pull to break up toughest layered rock . . . saves blasting. Other uses for Tournadozer: towing sprinklers, drawn graders . . . pulling heavy equipment and supplies mounted on flat-bed trailer . . . hauls anywhere on or off highway.

**PUSHES TREES OVER** . . . Forked, 23 1/2'-long boom reaches high up on tree for extra leverage. When Tournadozer shoves, boom angle creates down-pressure on ground-grip tires . . . as the push increases, so does the traction. Uses same A-frame and PCU as Bulldozer blade . . . is readily interchangeable. Quickly pays for itself on large clearing contracts.

**LETOURNEAU**  
PEORIA, ILLINOIS



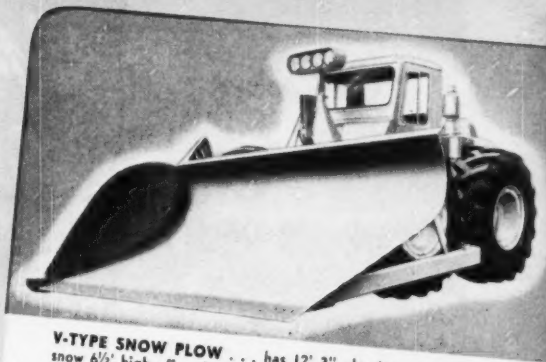
**TOURNADOZERS**

**IT'S RUBBER THAT PUTS THE ACTION IN TRACTION**



# with **TOURNADOZER**

**T**ournadozer's faster-than-crawler speeds and 100% mobility on rubber can now be utilized on any job with a full line of interchangeable tools. These auxiliary Tournadozer tools offer new profit opportunities on your work — assure steady earnings the year-round on pushing . . . pulling . . . and lifting jobs. With each unit, Tournadozer's 180 h.p. engine, 4-wheel drive, and rubber-tired speeds will pay off in more work done . . . in faster moves on the job, and between jobs. Let your local LeTourneau Distributor give you all the facts. Call him . . . or write TODAY!



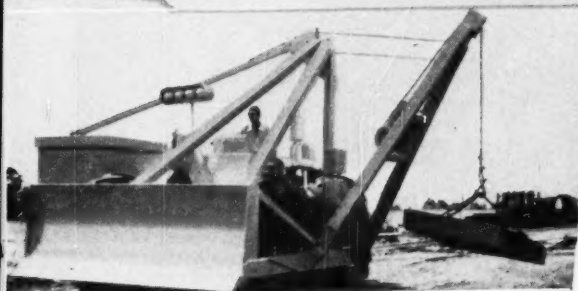
**V-TYPE SNOW PLOW** . . . has 12' 3" clearing width . . . flows snow 6½' high off ends of plowshare blade. Vertical divider plate, welded in center of "V", cuts frozen drifts . . . eliminates plowing snow back onto road when widening. . . . Adjustable runner shoe, giant tires protect surface. Assures steady earnings during winter months! Optional electrically-operated Snow Wing available.



**ANGLEDZOZER** . . . for extensive side-hill work, Tournadozer's regular Bulldozer is easily interchangeable with Angledozer blade and side arms. Husky 13' x 41½" blade can be angled 20° right or left . . . optional electric motor tilts either corner of blade 10° up or down for digging with blade point. Works off the same A-frame and fast-acting electric PCU as Bulldozer blade.



**ROOT RAKE** . . . offers you another low-cost, specialized tool for handling brush clearing with Tournadozer. Husky 11' 8" x 3' 4" rake has 10 curved teeth of 4" high-grade, heat-treated steel, placed 9" apart, for grubbing out roots, raking aside rocks. Gets the complete job done because of high-speed maneuverability and rubber tires . . . stacks brush in higher piles.



Send now to: **R. G. LeTOURNEAU, INC., Peoria, Ill.** Tell us more about Tournadozer with:

NAME \_\_\_\_\_  
 TITLE \_\_\_\_\_  
 COMPANY \_\_\_\_\_  
 STREET \_\_\_\_\_  
 CITY, STATE \_\_\_\_\_

- |  |                                     |
|--|-------------------------------------|
| <input type="checkbox"/> Bulldozer     | <input type="checkbox"/> Snow Wing  |
| <input type="checkbox"/> Angledozer    | <input type="checkbox"/> Snow Plow  |
| <input type="checkbox"/> Tree Pusher   | <input type="checkbox"/> Root Rake  |
| <input type="checkbox"/> Logging Dozer | <input type="checkbox"/> Side Crane |
| <input type="checkbox"/> and Winch     |                                     |
| <input type="checkbox"/> Rotters       | <input type="checkbox"/> Rollers    |
|  | <input type="checkbox"/> Carryalls  |



## Specify Thermoid Conveyor Belting

### Fit Thermoid Quality and Experience into Your Belting Picture

**It Will Pay You to  
*Specify* Thermoid**

Thermoid high quality stems from continuing research and product development. To complete this picture, your Thermoid distributor and the Thermoid field representative, working as a team, offer you practical experience in solving your particular problem.

Whether it's run-of-the-mill or something "special", your Thermoid distributor can help you select the right Thermoid Conveyor Belt. And the down-to-earth advice of Thermoid field representatives is welcomed by men faced with belting trouble in mining, quarrying and construction operations. They know this advice is the result of day-by-day experience with conditions *in the field*.

If your belting fails prematurely—if you're stumped with a tough belting problem—call your Thermoid distributor. Together with the Thermoid field representative, he can help you get greater economy, efficiency and tonnage for your belting dollar.

*Thermoid Quality Products: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Molded Products • Industrial Brake Linings and Friction Materials.*

**Thermoid  
Company**

**Main Offices and Factory • Trenton, N. J., U. S. A.**

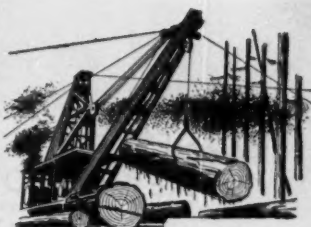
**Western Offices and Factory • Nephi, Utah, U. S. A.**

**Industrial Rubber Products • Friction Materials • Oil Field Products**

For better  
service  
use the right rope



For rotary drilling,  
**PREformed, Internally Lubricated** wire line designed to wind smoothly on drums and to withstand abrasion from running through blocks.



For logging operations,  
tough flexible ropes for tractor arch lines, chokers, skidders and loading.

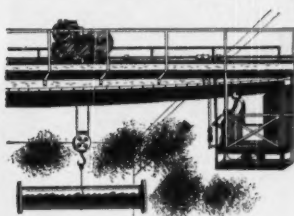


For shovels and draglines,  
ropes for different sizes and types of equipment designed to give best service for your particular needs.

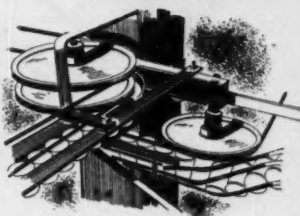
The right rope  
for each job is  
available from



For shaft mining,  
shallow or deep, internally lubricated ropes to meet all load and speed requirements.



For cranes and hoists,  
small or large, **PREformed Internally Lubricated** wire ropes of the correct size and flexibility for each use.



For can conveyors,  
there are bright carbon steel, stainless steel and monel metal wire ropes to meet various service conditions.

*A thousand and one*  
**MACWHYTE**  
*Internally Lubricated*  
**WIRE ROPES**

### It pays to choose the right rope for your equipment

Besides the ropes listed above, Macwhyte makes many more such as cable tool drilling lines, elevator cables, incline or haulage ropes, scraper ropes, aircraft control cable assemblies, ropes for ship

rigging and guying work, as well as hundreds of sizes and types of single-part, round-braided or flat-braided slings for material handling.

To get the best service, keep down maintenance costs, and save wire rope dollars, call your Macwhyte distributor or write direct to Macwhyte Company for recommendations. Catalog on request.

### MACWHYTE WIRE ROPE

**MACWHYTE COMPANY** 2941 Fourteenth Avenue, Kenosha, Wisconsin Manufacturers of Internally Lubricated **PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope.** Our distributors and mill depots carry stocks for immediate delivery. Mill Depots: New York • Pittsburgh • Chicago • Minneapolis • Fort Worth • Portland • Seattle • San Francisco • Los Angeles

# BARNES FLIES TO THE AID OF FLOODED WINNIPEG— AIR-LIFT DELIVERS PUMPS WITHIN 5 HOURS



Loading Barnes "33,000 for 1" pumps on board the C-46 for the record flight to Winnipeg. Within 5 hours from the time the order was received, the pumps were hauled to the Mansfield Airport, loaded and delivered to Winnipeg.



Flooded Winnipeg as seen from the air—one of the worst flood disasters in recent history. (Wide World Photo)



**BARNES 90M AUTOMATIC  
CENTRIFUGAL PUMP**

Barnes, securing the aid of the U. S. Air Force, set a record in delivering a plane load of Automatic Centrifugal Pumps for emergency pumping at Winnipeg, during the recent flood disaster. On the same day the order was received, and within 5 hours, these "33,000 for 1" Barnes Pumps were in Winnipeg and ready for work.

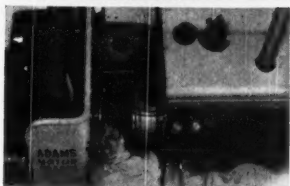
Again, here is a case where full reliance was placed in Barnes; and again Barnes service and Barnes pumps came through. With pardonable pride, we believe Barnes is unmatched for service, just as its pumps are unmatched for performance.

## BARNES MANUFACTURING CO., MANSFIELD, OHIO





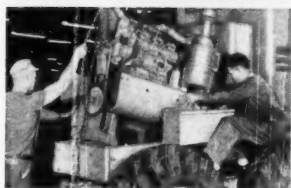
REAR AXLE  
REPLACED  
BY 1 MAN  
IN FROM 2  
TO 4 HOURS



CLUTCH  
OVERHAUL  
REQUIRES  
1 MAN 4  
HOURS OR  
LESS



TRANS-  
MISSION  
REMOVED  
BY 2 MEN  
IN 2½ HOURS  
OR LESS



ENGINE  
REMOVED  
BY 2 MEN  
IN 3 HOURS  
OR LESS

# Adams *Motor Graders*

## DESIGNED BETTER FOR FAST SERVICING

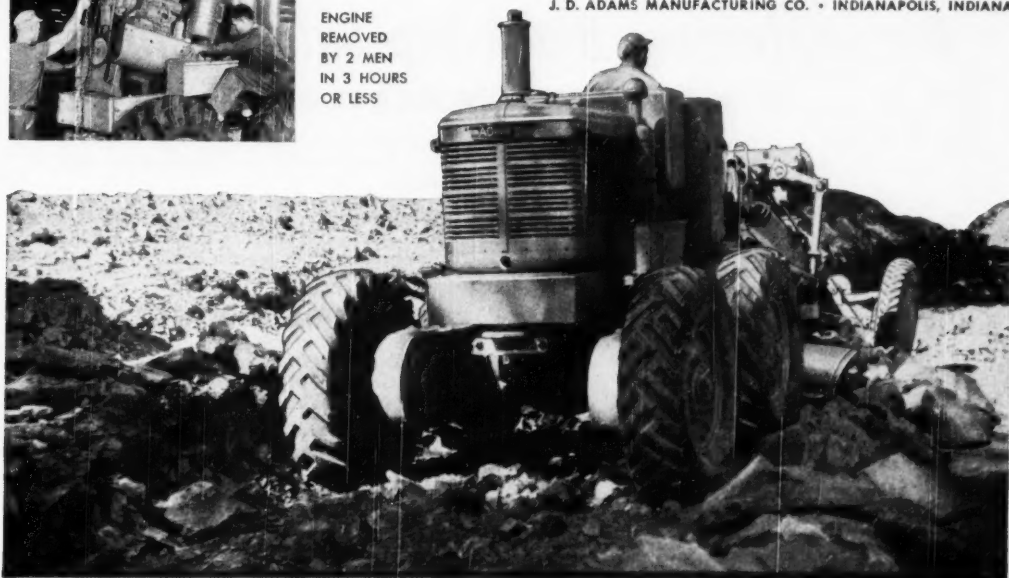
◀ Fewer hours in the shop—more hours on the job . . . that's what the fast, easy-servicing features of Adams Motor Graders mean to owners. Note in the accompanying photographs how usually difficult major repairs are accomplished in minimum time, with minimum effort.

## BUILT STRONGER FOR TOUGH WORK

▶ On the job, owners quickly discover that Adams Motor Graders have abundant power, strength and stamina—plenty of everything it takes for handling roughest, toughest work . . . for punching shale out of hillsides—making heavy ditch and bank cuts—scarifying hard surface material—bucking through deep snow drifts, etc.

Let your near-by dealer show you how Adams Motor Graders save you time and money—on the job and in the shop.

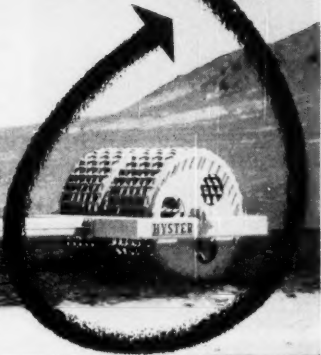
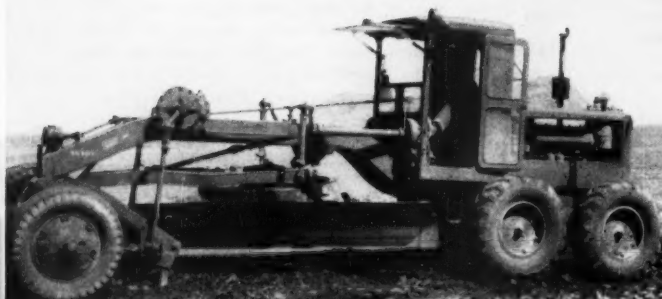
J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA



*Make your next  
motor grader an*

# Adams

## *The* **NEW HYSTER GRID ROLLER**

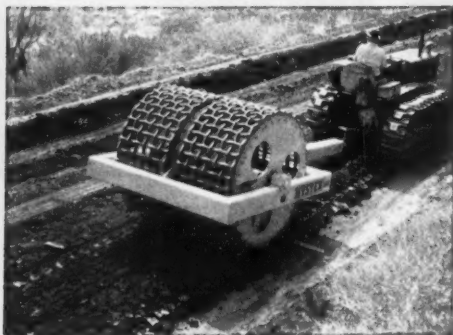


### *Revolutionizes Black Top Salvage Jobs*

#### **HOW IT WORKS...WHAT IT DOES**

- 1.** Black top is scarified by motor grader pulling Grid Roller.
- 2.** Scarified black top is pulverized to a maximum of small "fines" by Grid Roller.
- 3.** Pulverized black top is windrowed—road bed cleaned by motor grader—compacted by Grid Roller.
- 4.** Windrow is spread and oil applied, material mixed and relaid and then compacted by Grid Roller. Now ready for seal coat.

#### **SAVES UP TO 50% IN TIME...RECLAIMS MATERIAL**



Saving in oil of \$343 per mile on a bituminous salvage job. Hyster Grid Roller pulled by a "Caterpillar" D4 tractor.

- 1.** In ONE day ONE man with motor grader and Grid Roller can salvage and prepare ONE MILE of black top road for oiling.
- 2.** Grid Roller produces greater abundance of FINE MATERIAL.
- 3.** Oil usage reduced up to  $\frac{3}{4}$  of a gallon per cubic yard—on one county road job a savings of \$343 per mile in oil was effected.
- 4.** Grid Roller salvages all types of black top material. NO NEED TO HAUL AWAY OLD MATERIAL.

Sold exclusively by your "CATERPILLAR" DEALER.  
CONSULT HIM FOR FACTS, FIGURES, LITERATURE.

### **HYSTER® COMPANY**



2921 N. E. CLACKAMAS, PORTLAND 8, OREGON  
1821 NORTH ADAMS ST., PEORIA 1, ILLINOIS



## **LINK-BELT ROLLER CHAIN KEEPS ADAMS MOTOR GRADERS ON THE JOB!**

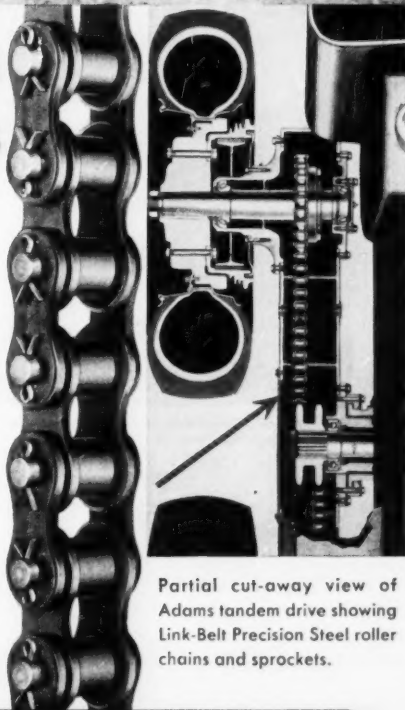
Grading, terracing, leveling, snow removal jobs can't wait. Link-Belt Precision Steel Roller Chain and cut tooth sprockets provide dependable tandem drives which keep the graders moving.

Consider properly applied Link-Belt Roller Chain drives for economic solutions to your construction machinery driving problems.

### **LINK-BELT COMPANY**

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Johannesburg. Offices in Principal Cities.

11,959



Partial cut-away view of Adams tandem drive showing Link-Belt Precision Steel roller chains and sprockets.

**LINK-BELT**  
ROLLER CHAINS



*Precision Steel*  
AND SPROCKETS

# Beauty that's more than Skin Deep

**BUILT WITH  
UNI-FORMS**

**TO BE**

*Fireproof  
Stormproof  
Vermin Proof*

**AND  
PERMANENT!**



CARIBE HILTON HOTEL, San Juan, Puerto Rico  
ARCHITECTS: Toro, Ferrer & Torregosa CONTRACTOR: Geo. A. Fuller Co.



UNIVERSITY OF PUERTO RICO FACULTY APARTMENTS, Rio Piedras, Puerto Rico  
ARCHITECT: Henry Klumb • CONTRACTOR: Jorge Rosso



## **UNI-FORMS ARE "GOOD BUSINESS" FOR ALL THREE:**

**CONTRACTOR:** UNI-FORMS give the builder speed . . . economy . . . production line efficiency . . . maximum utility . . . they're ready to use . . . require 1/3 as much alignment and bracing as conventional forms . . . save **TIME, LABOR AND MATERIALS**...are permanent equipment for long-time use.



**ARCHITECT:** UNI-FORMS are versatile . . . flexible . . . they can form anything . . . permit widest latitude in design . . . always assure beautiful, easy to finish concrete.

**OWNER:** UNI-FORMS build safer structures . . . resistant to fire, storm, wind and explosion . . . assure permanency . . . beauty . . . lowest initial cost . . . lowest annual maintenance cost . . . lowest insurance cost.

## **UNIVERSAL**

*Form Clamp Company*

Founded 1912

1238 N. KOSTNER

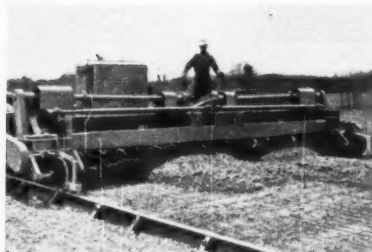
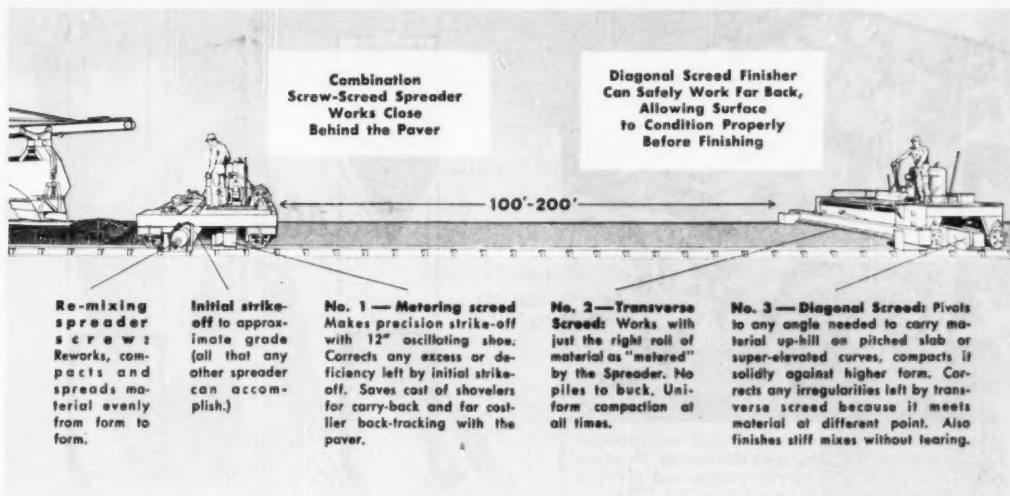
CHICAGO 51, ILL.



# Jaeger 3-Screed Paving Team

(Accurate Metering Screed on the Spreader,  
Transverse Screed and Diagonal Screed on the Finisher)

**gets faster production and labor-savings  
never before possible on concrete slab**



THE JAEGER MACHINE CO., Columbus 16, Ohio

Note how the above Jaeger method fully mechanizes your operation, effects direct labor savings in front and in back of finisher, and insures faster, steadier, easier production of the maximum daily yardage your dual drum pavers can produce. Has eliminated requirement of a second finisher behind the spreader on high production work in several states.

**Jaeger Type CSS Combination Screw-Screed Spreader:** The only spreader that positively eliminates segregation and improves uniformity by remixing on the subgrade — and also accurately meters to the finishing machine by second strike-off with 12" oscillating screed. Same machine can both spread and finish concrete base for bituminous surfaced city streets. Widths 10-15, 20-25 ft. Also available without oscillating metering screed, if so desired.

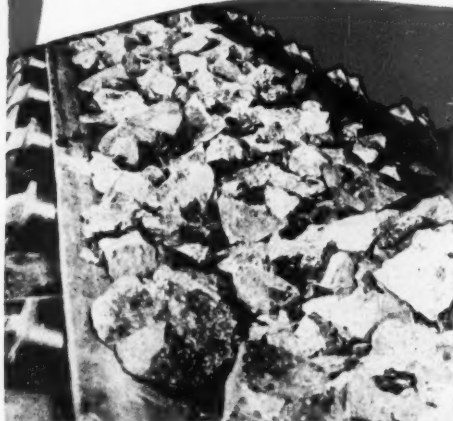
**Jaeger Type X Diagonal Screed Finisher:** The only finishing machine that can finish flush to higher form on pitched slab and super-elevated curves. Screed angle instantly adjustable as required. Angle finishing also averages out any irregularities left by front screed and finishes stiff concrete without tearing. Widths 10 to 32 ft.

Ask your Jaeger distributor or send for complete Concrete Paving Catalogs



**JAEGER**  
engineered equipment  
PUMPS • MIXERS • COMPRESSORS • HOISTS

# "GUILLOTINE" TEST Proves 50% MORE CUSHION in *Homocord* CONVEYOR BELTS



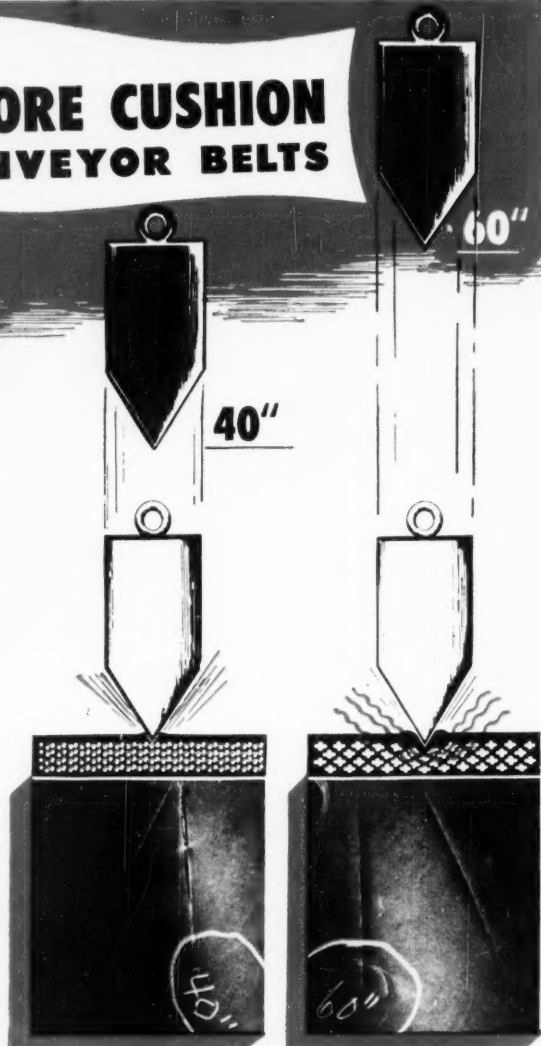
When rocks like those shown here drop on a conveyor belt, every shock at loading point shortens the life of the belt. To overcome this, extreme cushion and resilience are built into Homocord Conveyor Belts. This "Through-and-Through" Cushion gives Homocord Conveyor Belts longer life than any other belt.

To measure comparative cushion and shock-absorbing qualities, Raybestos-Manhattan engineers devised the "killer" test shown at right. A heavy metal weight, ground to a blunt edge is dropped from various measured heights until it ruptures the cover of the sample under test.

Notice the shock lines indicate how a regular conveyor belt's "boardy" resistance to impact leads to cover gouging and breakdown. The shock lines on the Homocord cross section show how "Through-and-Through" cushion and resilience of the Homocords absorb impact without injury.

## *Homocord* CUSHIONED CONSTRUCTION HAS 8 ADVANTAGES

1. Complete bonding of every member into a homogeneous structure.
2. Holds metal fasteners, with no loss of draw-bar strength.
3. Lateral flexibility permits perfect troughing, accurate training, reduces fatigue of flexing at bend in troughing idlers.
4. Resists destructive action of continuous or heavy impact feeding.
5. Cushion Homocord body and low inelastic stretch reduce wear and tear of top cover.
6. Homocord body reduces hazard of punctures.
7. The Homocords are completely encased in Flexlastics; moisture not admitted, mildew cannot start.
8. Longer life, lower cost per ton.



## REGULAR DUCK BELT

Unretouched photo shows actual rupture results of a 40" Guillotine Drop Test on a conventional 4-ply 32-oz. duck belt with 1/8" top cover, 1/16" bottom cover. With little cushion to absorb impact, the cover ruptures and deterioration sets in.

## *Homocord*

Unretouched photo shows comparable degree of impact effect from a 60" Guillotine Drop Test on a 4-ply AEH Homocord Conveyor Belt with 1/8" top cover and 1/16" bottom cover. Impact of falling weight is dissipated through the Homocords, cushioned in Flexlastics.

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY



## RAYBESTOS-MANHATTAN, INC.

Manufacturers of Mechanical Rubber Products • Rubber Covered Equipment • Radiator Hose • Fan Belts • Brake Linings • Brake Blocks • Clutch Facings • Packings • Asbestos Textiles • Powdered Metal Products • Abrasive & Diamond Wheels • Bowling Balls

# 3 1/4 YARDS OF *Speed, Power, Hang-on*

Look at a Lorain TL-25 . . . on the job . . . compare its performance with any other 3/4-yd. machine. Watch it dig! Watch it swing! Watch it bite into tough material! You can see it's faster, more powerful, with the stamina to hang-on until the 3/4-yard dipper is heaped. Lorain TL-25's easily prove their ability to out-perform others everywhere they work. And here are "built-in" reasons that make them the leaders of their class!

A COMPLETE PACKAGE • INTERCHANGEABLE "PACKAGED" COMPONENTS • 5 IDENTICAL CLUTCHES • ONE-PIECE BED • OIL-ENCLOSED CUT GEARS • INTERCHANGEABLE PARTS • ANTI-FRICTION BEARINGS • HOOK ROLLERS • QUIET, SMOOTH OPERATION • 7 MODELS TO CHOOSE FROM — 3 CRAWLERS AND 4 RUBBER-TIRE MOUNTINGS



THE THEW SHOVEL CO., LORAIN, OHIO

You Can Bank On  
**TL-25**  
 For Profits!

**THEW LORAIN®**

SHOVELS • CRANES • CLAMSHELLS • DRAGLINES  
 HOES • MOTO-CRANES

**SEE YOUR THEW-LORAIN DISTRIBUTOR**

# ROUGH and TOUGH

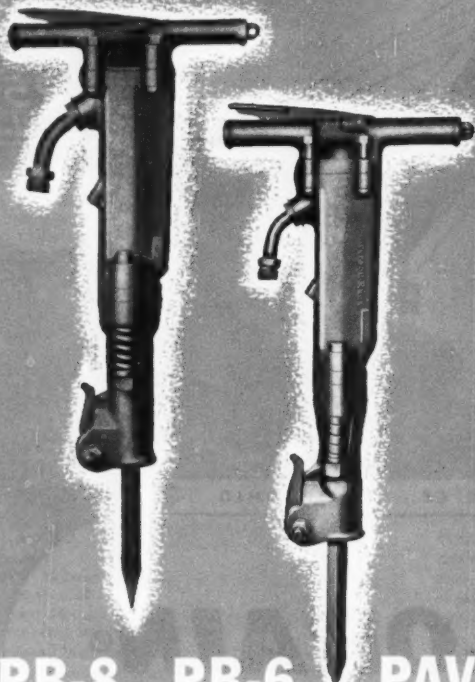
## *ON PAVEMENTS*



but so much

**EASIER**

on your operators!



**PB-8**

**PB-6**

**PAVING BREAKERS**

I-R paving breakers are built to give and take a beating — to slug it out on your toughest pavement and demolition jobs, with minimum wear and tear on both the machine and the operator.

They're easy to manipulate—with big sturdy handles, long smooth surface for the knee in prying, and excellent working balance. The air connection is out of the way, and the latch bolt is easy to open or close. A gradual throttle release with automatic cutoff gives easy starting, better speed control.

Other features include a new double-kicker port valve—full air cushioning—four-bolt handle—oil reservoir and metering device for proper lubrication of all parts.

Use the 82-lb. PB-8 for the heaviest duty service, and the 58-lb. PB-6 where a lighter-weight machine is needed.

Ask your I-R representative for full details.

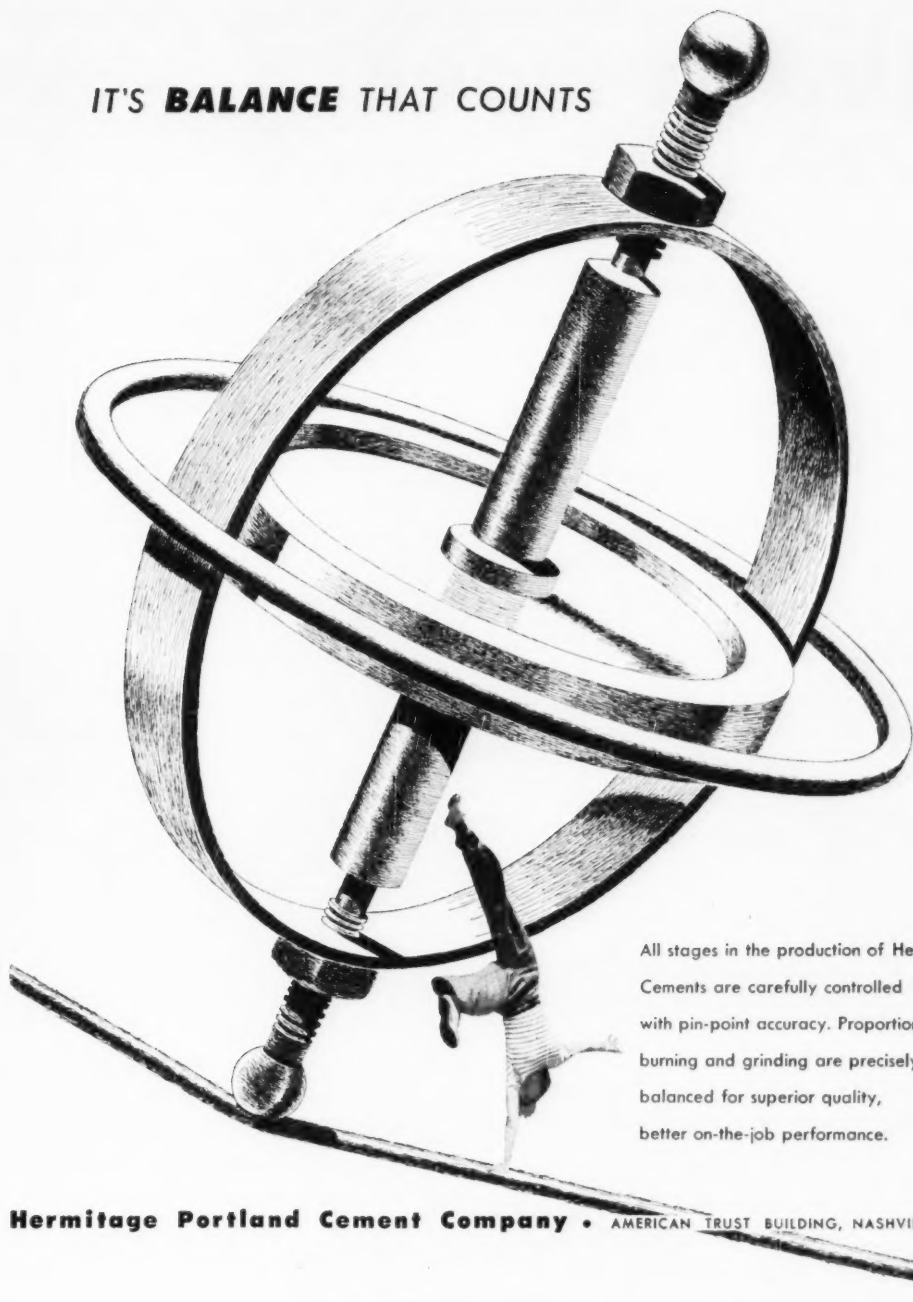


**Ingersoll-Rand**

11 BROADWAY, NEW YORK 4, N. Y.



IT'S **BALANCE** THAT COUNTS



All stages in the production of Hermitage Cements are carefully controlled with pin-point accuracy. Proportioning, burning and grinding are precisely balanced for superior quality, better on-the-job performance.

**Hermitage Portland Cement Company •** AMERICAN TRUST BUILDING, NASHVILLE 3, TENN.

PORTLAND  
HIGH EARLY STRENGTH  
AIR ENTRAINING  
MASONRY



# HARD AT WORK

# IN LAZY WATERS



CANAL CLEANING IN LOUISIANA WITH A 200-W.

**W**HETHER the job is widening a bayou, building a levee or deepening a canal, Bucyrus-Erie walking draglines consistently show their leadership in fast job completion and high output. Their outstanding performance is a result of years ahead engineering, from walking shoes to boom point.

No other walking system has the simplicity, strength, cushioned action and freedom from pin-connected linkage that characterizes the Bucyrus-Erie rolling cam walking mechanism. "Know-How" de-

sign keeps rim pressures low to eliminate ground coning. Unmatched boom design features all-welded tubular construction for light weight and great strength . . . permits handling heavy pay loads, yet keeps swing inertia and roller loads low.

These are only a few of many features which put Bucyrus-Erie walking draglines out front on the big yardage jobs. Available in a wide range of sizes and capacities to fit all job requirements.

47M49

## BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN



## This fleet economy can be yours!

THE Chicago & West Towns Railways, Inc. operate a fleet of over 200 buses. Despite punishing conditions of city operation, these fleet units are running up record mileage between overhauls. Back of their performance is a clue to lower maintenance costs for you.

In 1942, officials of this fleet switched their units to STANOLUBE HD Motor Oil upon the advice of a Standard Oil Automotive Engineer. The object was to stop deposit troubles. The results far exceeded that original goal.

"The problem of sludge in our engines has been eliminated," writes L. P. Reilly, superintendent of equipment. "Since we started to use STANOLUBE HD Motor Oil, we have extended our overhaul periods from 125,000 miles to approximately 175,000 miles. We

attribute the highly satisfactory performance of our units to good maintenance practice and effective lubrication by STANOLUBE HD Motor Oil."

The advantages offered you by STANOLUBE HD are multiplied by an automotive engineering service that's unique in the Midwest. The Standard Oil Company has a specially trained and experienced lubrication specialist located practically at your doorstep. This man will give you "on-the-spot" engineering service that's vital to fleet operations. His headquarters are the nearest Standard Oil Company (Indiana) office. To obtain his assistance, contact that office or write:

Standard Oil Company (Indiana), 910 South Michigan Ave., Chicago 80, Illinois.

# STANOLUBE HD

REG. U. S. PAT. OFF.

## Motor Oil

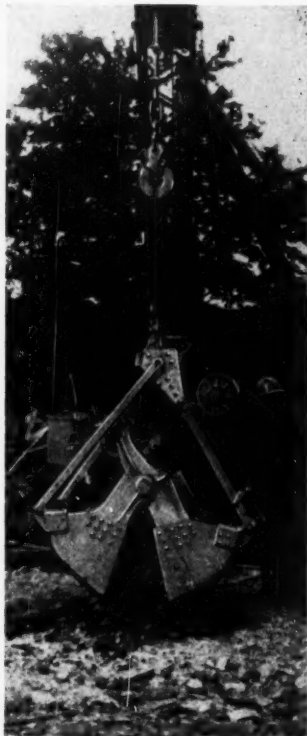
**STANDARD OIL COMPANY (INDIANA)**



## Construction News in Pictures...



**OLD BRIDGE**—New York's famed Brooklyn Bridge spanning East River is modernized after 67 yr. Car tracks and their supporting structure are being removed, and roadway expanded to six lanes. Here, old girder salvaged from track supports is jockeyed into place to serve as a new top chord of deepened stiffening truss. Terry Steel Contractors Inc., New York, is sub for Brooklyn's J. K. Welding Co. on \$3,320,000 job.—Wide World Photo.



**NEW BUCKET**—Conventional clamshell bucket, with air-powered hoist attached, is handled by single line from stiffleg derrick to muck-out deep shaft. Hoist controls bucket closing line, is operated by man at shaft bottom. Rigged up when difficulty of transmitting signals to derrickman slowed job, air bucket cut mucking time in half, cut labor crew 60%, and saved \$486 hoist cost in 9 days.—Compressed Air & Gas Institute Photo.



**CONSTRUCTION TRAIN**—International TD-24 tractors of J. D. Armstrong Co., Ames, Iowa, are all equipped with push plates for mutual assistance in loading Bucyrus-Erie scrapers. Train loading increases their efficiency 15 to 20% on this Missouri

River levee job of Armstrong's near Rockport, Mo., for Omaha District, Corps of Engineers. Average loading time is 30 to 45 sec, with average 4½-min cycle on 750- to 1,000-ft haul. Rigs handle 130 to 160 loads (12 yd truck) each 11-hr day.





**Here's**

**ONE-MAN**

**Loading**

**At 280 Cu. Ft.  
Per Min.**

## **Austin 8-C Overshot Loader\***

\*For crawler tractors with 28,000 lbs. minimum drawbar pull.

On short runs you can make three loads a minute in bank run or stockpile material — more than 10 yards every 60 seconds. Simple one-man operation and utilization of the tractor engine for all power permit rock-bottom costs on every count. Fuel costs for overshot loading are about the same as for normal dozing operations.

- **Double Duty for Your Tractor.** The Austin Overshot Loader bucket is interchangeable with an 11-ft. Austin dozer blade for leveling, pushing, etc. Screw type adjustments give positive control of blade or bucket pitch, and the cable control system gives constant and easy control of blade height or bucket operation through the full cycle.
- **Easy to Use and Maintain.** The Austin Loader is powered through a Caterpillar Model 25 Cable Control Unit. A wrap-around laminated chain driving wrap-around cable sheaves is chain driven through a floating jack-shaft arrangement.

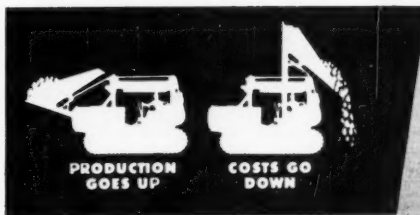
The result is maximum power on initial lift and maximum speed through the loading cycle, completed automatically while the tractor is in motion. Single lever control with automatic brake means easy operation. Simple and rugged construction gives long life and maintenance economy.

- **Also for Underground Mining.** The straight on-a-line loading possible with Austin Overshot Loaders is especially valuable where space is at a premium, as in underground mining. There is no swinging or blocking; overhead clearance is reasonable, and overall width is well under 10 ft. for the 8-C. (Less on smaller models.) For driving tunnels, for mucking, excavating, stockpiling and other duty, use an Austin Overshot Loader and save your expensive equipment for other duty. An Austin has a place in any operation.

### **OTHER MODELS**

**1, 1½ and 2½ cu. yds. rated capacity**

**Write for Folder and Name of Your Nearest Dealer**



# **John Austin, Inc.**

**D E N V E R , C O L O R A D O**

Cable Address: "FORTRADE," DENVER  
Export Division: P. O. Box 5043, Terminal Annex,  
Denver 17, Colorado, U.S.A.



**ISLAND FARM**—Recent floods from Missouri and Skunk Rivers didn't bother farmer Harry Nielsen's homestead near Blencoe, Iowa—he and contractor brother (Wilbur Nielsen Construction Co.) built dike around property. Earth wall was kicked up by Caterpillar R4 bulldozer, crawler-drawn LeTourneau 8-yd Carryall and 1-yd dragline at cost of \$600. Some day, other enterprising contractors will turn to building similar dikes for farsighted farmers to keep their extra equipment operating during slack construction seasons.—Des Moines Register & Tribune Photo.



**DEBRIS DUMPER**—Clean-up cart handles trash from clearing operations at Hungry Horse Reservoir on South Fork of Montana's Flathead River near Kalispell. Cart is dumped by cable unit on International TD-18 that hauls it around site for hand loading. Fitted with Isaacson dozer, tractor will also police fire when trash is burned. Contractors Wixson, Crowe & J. H. Tisdale, Redding, Calif., are clearing 7,000 acres for USBR.



**SEEING EYE**—Deep-diving camera (right) takes subsurface pictures at any depth in wet or dry, cased or uncased holes 7 in. or larger. Developed by Claude Laval, Jr., Fresno, Calif., camera has proved useful for investigating casing breaks in deep wells and for geological explorations. Unit can take up to 800 twin photos before return to surface, and indicates depth at which they are taken. Four-in. model is now being built.

(Continued on page 40)

**TODAY...**

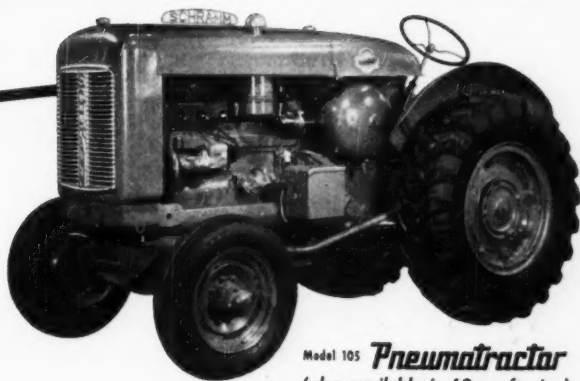
**Just As You Wouldn't Use A  
Horse and Buggy**



**You Wouldn't Use An Old  
Model Air Compressor**



**When You Can Use The  
SCHRAMM  
*Pneumatractor***



The SCHRAMM *Pneumatractor* may very aptly be termed the "Newest of the New"—a self-propelled air compressor literally packed with far advanced features that put it in a class by itself. Its desirability over an old model air compressor can be likened to your preference for the modern automobile over the horse and buggy.

Here is why you should choose the SCHRAMM *Pneumatractor*. It can be easily transported . . . is strong, rugged, husky . . . and costs less than a separate tractor and separate compressor. Moreover, it is so flexible you can use it for an endless variety of compressed air jobs!

Going hand-and-hand with the *Pneumatractor* is the complete line of SCHRAMM auxiliary equipment also available . . . approved equipment which will enable you to do your job better.

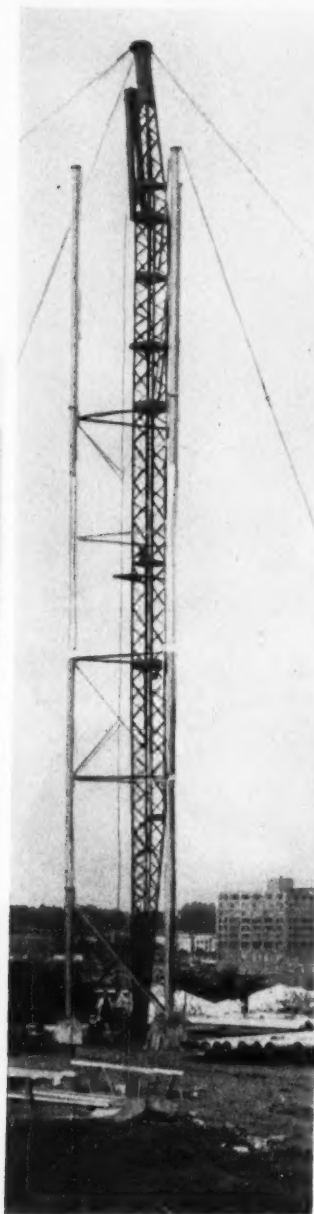
Write today for Bulletin NEU-50B describing this most modern of air compressors and auxiliary equipment. In today's compressed air needs, you will find the *Pneumatractor* a "must".

Model 105 *Pneumatractor*  
(also available in 60 cu. ft. size)

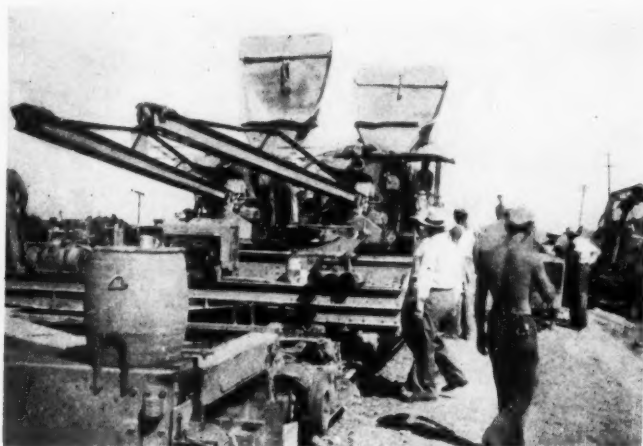
**SCHRAMM INC.**

*The Compressor People*

**WEST CHESTER • PENNSYLVANIA**



**TALL TOWER**—Novel 100-ft. gin-pole erects country's tallest TV tower—1,057-ft. structure for WCON, Atlanta. Operated by three-drum hoist, pole is free to revolve like guy derrick mast, and has stub boom pinned near top. To set upper sections of 200-ton pipe-leg tower, pole was rigged as basket boom. Contractor is International Derrick & Equipment Co.



**TWIN PAVER**—To pave US 59 northwest of Denison, Iowa, Sioux City's Western Contracting Corp. hooked two 34E pavers side by side and operated them within 22-ft. road forms. Rigidly fastened together, driving mechanism of one rig moves both in unison, but separate operators handle loading and discharging independently.



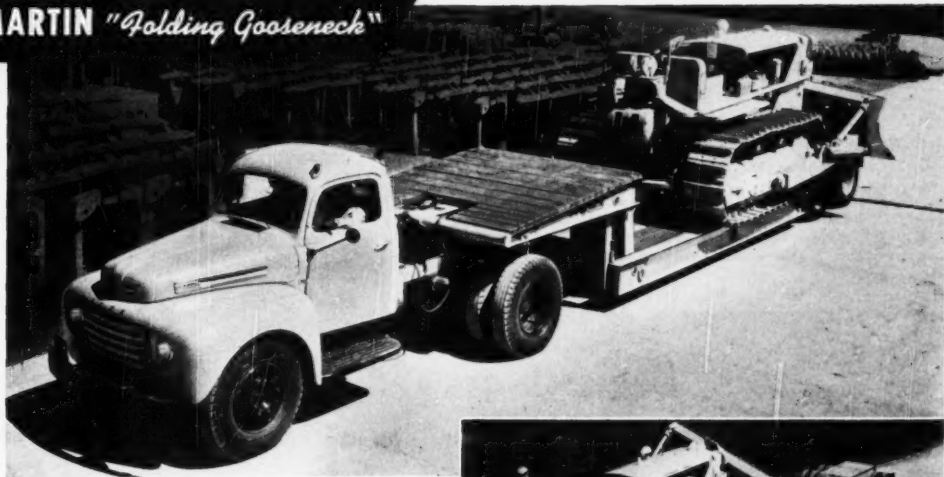
**ICY PORTAL**—Huge icicles endangered construction traffic through intake portal of Neversink Tunnel on New York City's new Delaware River water supply, and tunnel footage slowed while miners scaled ice at entrance. So Frazier-Davis Construction Co., St. Louis, contractor for tunnel, built 150-ft. protective canopy extending beyond ice zone. Timber canopy

is 12 ft. wide and 15 ft. high. Supporting bents 15 ft. c-c are bolted 12x12 posts and cap; roof is of longitudinal 6x8's on 18-in. centers, planked with 4x12's. It is strong enough to absorb impact of tons of falling ice. Tunnel, 10-ft. finished dia. will be 5 mi. long, and will carry Delaware River water from Neversink Reservoir to Rondout Reservoir on Hudson River watershed.

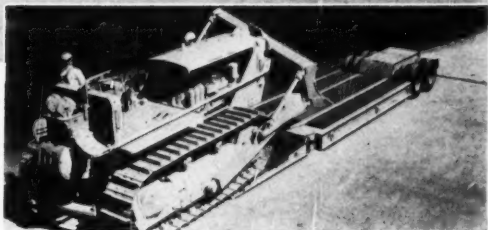


# MARTIN's exclusive features *cut man hours* with **TRAILERS** that *do away with ramps*

## MARTIN "Folding Gooseneck"

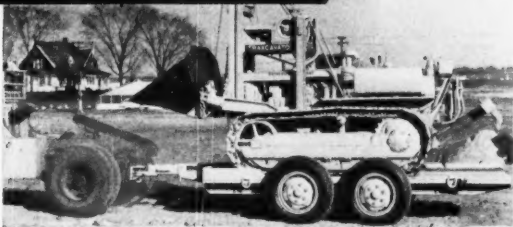


By eliminating cribbing and ramps, the new Martin "Folding Gooseneck" trailer speeds production, increases equipment hours. "Gooseneck" lowers to form own ramp; loading and unloading become fast, simple one-man operation. Low platform height increases clearance, roadability. Models F3T, F4T and F5T. Capacities: to 32 tons.



## MARTIN "Tilt-Type"

(MODEL 222)



Martin "Tilt-Type" trailers form their own ramps to add mobility to every job. Enables equipment to move from job to job where needed, with loading and unloading reduced to quick one-man operation. Operator merely drives on and pulls away, drives off and goes to work. Three Models: 22, 222 (shown here), and 333. Capacities: to 11 tons.



## THERE'S A MARTIN "CARRYHAUL" TRAILER FOR EVERY JOB

Martin "Carryhaul" trailers have many exclusive patented features specifically designed to save you time and money.

*Write* for complete information, specifications, on these and other Martin "Carryhaul" trailers.

**MARTIN MACHINE CO.**  
KEWANEE, ILLINOIS  
YOUR CATERPILLAR DEALER IS YOUR MARTIN DEALER

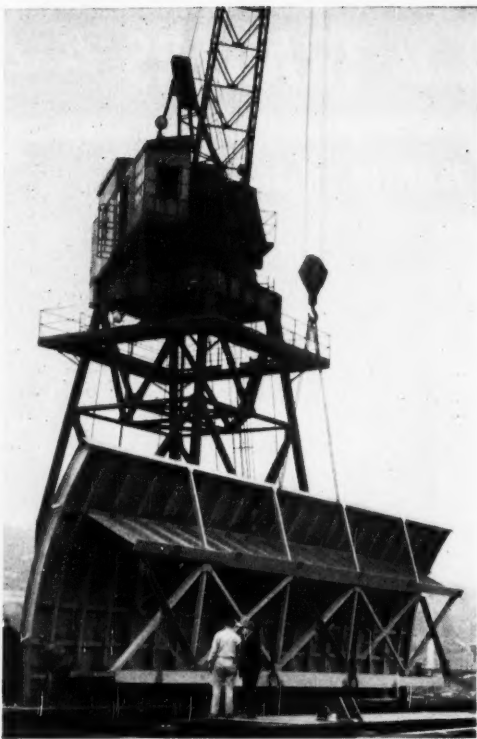
## CONSTRUCTION NEWS ... continued



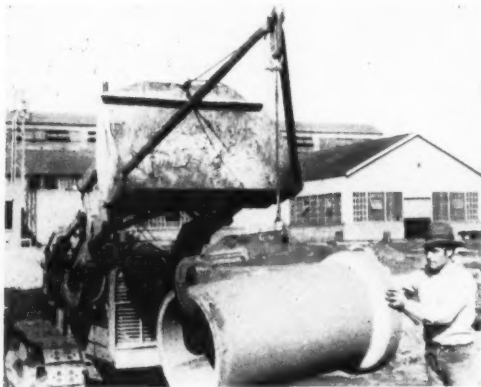
**QUARRY**—West Texas Stone Co., Lueders, handles limestone blocks with International TD-14 and Superior sideboom, replacing \$20,000 in stationary equipment. Mobile rig let quarry crew be cut from 25 to 4, while production increased 80%.



**STADIUM**—University of Michigan increases stadium capacity to 97,000 with 21,000-seat all-welded steel addition. For 7 mi of field welding required to join 1/4-in. plates, Detroit steel contractor Whitehead & Kales uses Lincoln welding machines and Fleetweld No 11 and No 5 electrodes.



**GATE**—Dravo Corporation loads 65-ft tainter gate for delivery to new Monongahela River dam at Morgantown, W. Va. Dravo's Contracting Div. is building dam and lock for Corps of Engineers, and Engineering Works Div. is fabricating six gates and six 70-ft plate girder service bridges to span dam's piers.

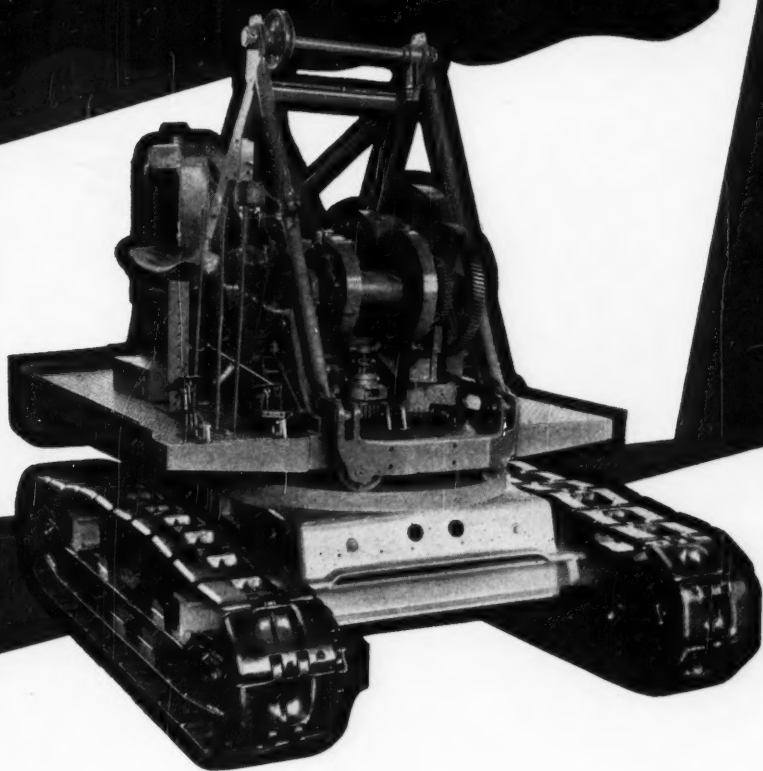


**HANDLER**—Simple A-frame of 2-in. standard steel pipe with flattened ends and wire rope backstay converts Allis-Chalmers HD-5 tractor and Tracto-Shovel into efficient pipe handler. Maintenance forces at West Coast plant rigged it up to lay 4-ft lengths of 21-in. sewer tile. They also made hairpin hook of bent 1/4-in. square bar with 3/4-in. plate strongback.



**COUPLER**—Simple pin-lifter on tunnel muck cars of St. Louis' Frazier-Davis Construction Co. makes uncoupling safe by keeping brakeman from between cars. Two arms welded to car frame hold levered rod with center bar that raises pin by chain. Nuts welded to rod keep it centered in arms, and at same time keep bar from dropping down to foul pin on curves.

For BIG value in a small shovel  
get BAY CITY



Yes — here is a 1/2 yard shovel built to big machine specifications. Dollar for dollar, point for point — make your comparison and *you will know* BAY CITY offers *biggest value*. Look at the efficient, compact machinery assembly on the unit-cast alloy steel base, and the well-balanced construction throughout. Look at the other money-making features — tandem drums on separate shafts — E-Z control power clutches — 20 anti-friction bearings exclusive of engine — helical gears for quiet, smooth operation. This is only part of the story . . . see your nearest BAY CITY dealer or write BAY CITY SHOVELS INC., BAY CITY, MICHIGAN.



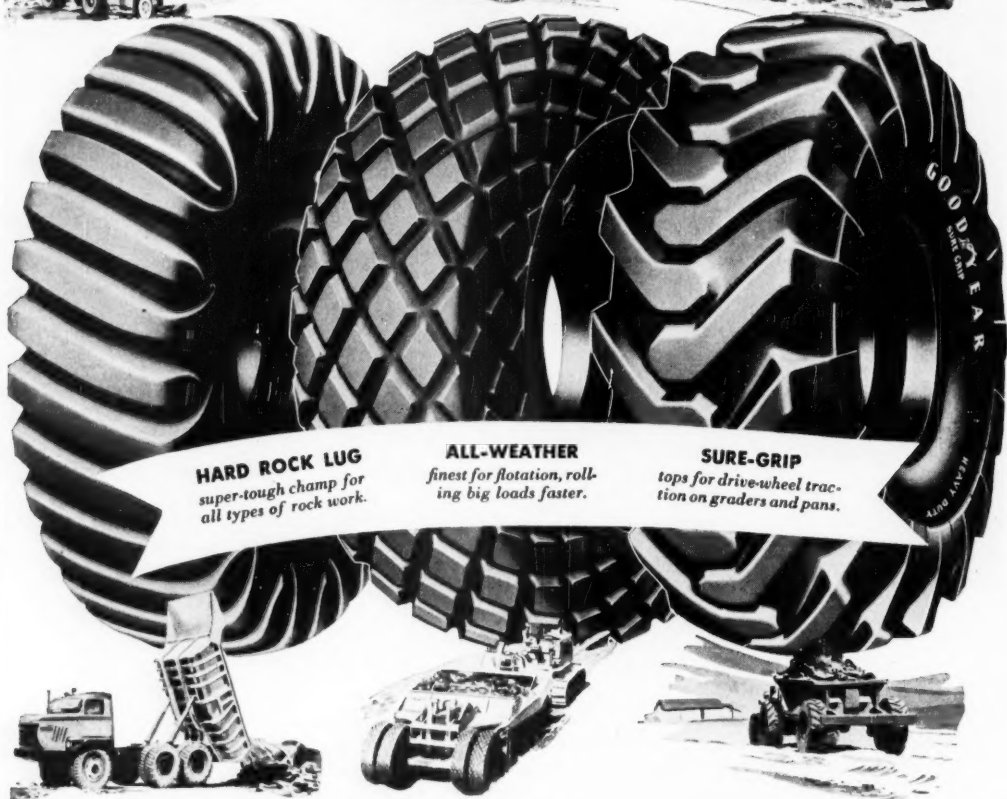
# BAY CITY



SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

**What's the job?**

**Here's the tire!**



**HARD ROCK LUG**  
super-tough champ for  
all types of rock work.

**ALL-WEATHER**  
finest for flotation, roll-  
ing big loads faster.

**SURE-GRIP**  
tops for drive-wheel trac-  
tion on graders and pans.

**D**OLLAR for dollar these three Goodyear construction tires have no equal for moving yardage faster—cutting tire costs—giving moneysaving performance.

**E**ACH is job-designed for a specific operation, specially engineered in tread and body to stand up longer in the toughest, roughest kind of service.

**T**HERE's a Goodyear work tire that's the *right* tire for your particular job. So remember, always **BUY** and **SPECIFY** Goodyear—experience shows it *pays!*

**GOOD YEAR**

All-Weather, Sure-Grip—T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

**MORE TONS ARE HAULED ON GOODYEAR TIRES THAN ON ANY OTHER KIND**



### Preventive Maintenance Pays Off

KEEPING YOUR EQUIPMENT in tip-top shape is our definition of preventive maintenance. In today's highly mechanized construction world preventive maintenance is most important. It means systematic general overhaul of equipment to minimize major repairs and expensive downtime. It means anticipating equipment troubles in advance and keeping machines in shape to avoid most of those troubles. It means calling upon your operating experience to determine where trouble spots are likely to occur and to guard against them. It means application of common sense and mechanical know-how towards keeping your expensive, yet productive, equipment rolling and producing to its utmost efficiency.

Because of the importance of the subject, we are devoting this entire equipment maintenance special issue to it. We are making no attempt to depict the points that must be greased every 20 min. or else; we are not listing the bolts that must be kept tightened ere the machine falls apart; we are not trying to tell you how to repair a broken frame. If your mechanics don't know these things you had better fire them pronto and get yourself some good mechanical talent.

What we are attempting in this special issue is to impress upon top construction management and their supervisory per-

sonnel the need for preventive maintenance. A sound maintenance program is just like a good safety program—it is only as good as construction management wants it to be. Don't forget that you men who select and pay for the equipment can have a lot to do with its production efficiency. You have the responsibility not only of planning for the best use of that equipment, but also of keeping it operating without breakdowns.

Featured in this issue are several articles entitled "Good Advice From the Manufacturer." These articles contain a lot of good, sound advice. They are the answer to the editor's query: "Tell us how to keep your type of equipment rolling." Obviously we couldn't include every type of equipment, nor could we select more than one manufacturer in each line. No doubt but what every manufacturer could have given us the same sound advice.

Three general, but mighty pertinent, points crop up in every manufacturer's article, and these can be applied to every type and make of equipment. They are:

(1) Become familiar with and utilize the operating and maintenance manuals and instruction books issued by the manufacturer. They have gone to great expense and trouble to compile these documents. Ignoring them is sheer folly if you want to get the utmost out of the equipment you buy. (2) Break in new machines gently and properly. Abuse or improper operation in the first few hours of the life of a machine may impair its efficiency forever. Why take a chance in ruining a productive and potentially profitable unit? (3) Keep the machine well lubricated. This almost seems like superfluous advice. Yet the horrible examples manufacturers cite concerning lack of lubrication are expensive instances of ruined equipment.

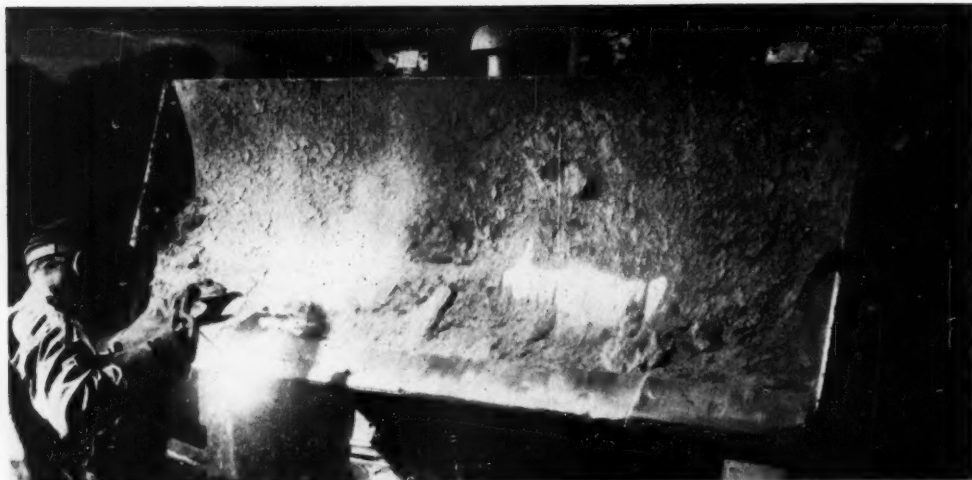
So here's your special issue on preventive maintenance of construction equipment. We hope it impresses upon you the need for a sound, regular maintenance program. The alternative to preventive maintenance is expensive downtime and extensive major repairs. No smart contractor wants these profit-robbing items to crop up on his job. Preventive maintenance pays off!

*Rich*



**SPIKE SEZ:** Maybe the boys don't go quite as far as Ed Randall shows them here in putting on top hats and tails, but they are mighty proud to climb aboard our trim, freshly painted and overhauled machines.

They'll turn out more work with less effort and in greater safety. And the treatment adds many years of useful life to the equipment. Yep, preventive maintenance sure pays off!



BULLDOZER BLADE surfaced on job with chromium carbide type electrode. This welding rod yields tougher deposit than tungsten carbide type for better resistance to severe abrasion and moderate impact.

## ARC-WELD SURFACING ... Why? Where? How?

By GORHAM WOODS, Development Engineer  
The Lincoln Electric Co., Cleveland, Ohio

THE BUILDING UP of a layer of metal or a metal surface by electric welding—commonly known as arc weld surfacing—has an important and useful application in construction equipment maintenance. Applications of the process are varied and many; such as restoring worn cutting edges and teeth on excavators; building up worn shafts with low or medium carbon deposit; lining a carbon steel bin or chute with stainless steel corrosion-resistant alloy deposit; putting a tool steel cutting edge on a medium carbon steel base; and applying wear-resisting surfaces to metal machine parts of all kinds.

Arc-weld surfacing includes, but is not limited to, hard surfacing. There are many building-up applications where hard surfacing is not required.

Wear, so far as construction equipment is concerned, is the gradual impairment of machinery parts through use. Excluding corrosion, wear results from various combinations of abrasion and im-

pact. Abrasive wear results from one material scratching another, and impact wear from one material hitting another.

### How to Resist Abrasive Wear

Abrasive wear is resisted by materials with a high scratch hardness. Sand wears metals with a low scratch hardness at a high rate, while under the same conditions it will wear a metal of high scratch hardness very slowly.

Scratch hardness, however, is not necessarily measured by standard hardness tests. Brinell and Rockwell hardness are not reliable measures for determining the abrasive wear resistance of a metal. A hard surfacing material of the chromium carbide type may have a hardness of 50 Rockwell C. Sand will wear this material at a slower rate than it will a steel hardened to 60 Rockwell C. The sand will scratch all the way across the surface of the steel. On the surfacing alloy the scratch will progress through the matrix material and

then stop when the sand grain comes up against one of the microscopic crystals of chromium carbide, which has a higher scratch hardness than sand.

If two metals of the same type have the same kind of microscopic constituents, then the metal having the high Rockwell hardness will be more resistant to abrasive wear.

### How to Resist Impact Wear

Whereas abrasive wear is resisted by the surface properties of a metal, impact wear is resisted by the properties of the metal beneath the surface. To resist impact, a tough material is used, one which does not readily bend, break, chip or crack. It yields so as to distribute or absorb the load created by impact; and the ultimate strength of the metal is not exceeded.

Included in impact wear is that caused by bending or compression at low velocity without impact, resulting in loss of metal by cracking, chipping, upsetting, flowing or crushing.

### Types of Surfacing Electrodes

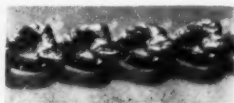
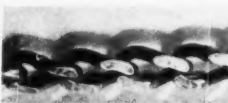
Many different kinds of surfacing electrodes are available. The problem is to find the best one to do a given job. Yet, because service conditions vary so widely, no universal standard can be established for determining the ability of surfacing to resist impact or to resist abrasion. Furthermore, there is no ideal surfacing material that resists



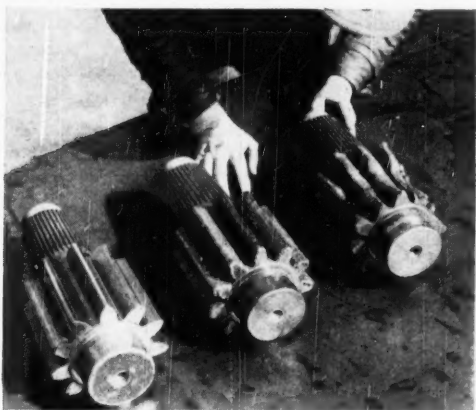
**BADLY WORN** auger is first built up with semi-austenitic electrode, then layer of tungsten carbide is deposited for wear resistance in highly abrasive material.



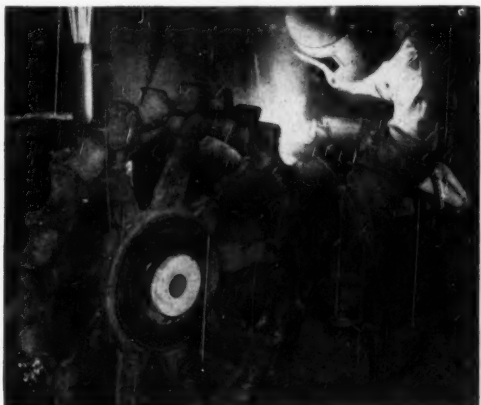
**WORN CUTTING** end sections of bulldozer blade (right) are repaired as shown at left. Edge is trimmed off and new piece of manganese steel is welded on. Stainless steel electrode joins manganese steel to carbon steel base metal in two passes. Joint is finished with manganese electrode and outer corner is surfaced on edge and both sides with tungsten carbide.



**EVEN TRUCK CHAINS** can be surfaced. Worn links (left) when reclaimed with semi-austenitic electrode with rough beads for added traction, (right) will last for two more seasons.



**PINION GEARS** are built up to size with a high carbon type electrode. Deposit can be machined.



**FOR WORN TRACTOR SPROCKETS**, building up with semi-austenitic electrode is recommended.

both impact and abrasion equally well. In manufacturing surfacing electrodes, it is necessary to sacrifice somewhat one quality to gain the other. A material that has a high resistance to abrasion will have a low resistance to impact. High impact resistance is gained through sacrificing abrasion resistance.

Price is no index to quality of electrodes. Simply because an electrode contains an expensive ingredient does not necessarily make it superior for wear resistance. Thus, the user of surfacing materials must rely on the manufacturer's recommendations and his

own tests to determine the best surfacing material for his purpose.

Surfacing materials can be placed in two general classes: (1) Those whose hardness properties are not appreciably affected by heat treat-

ing; (2) those whose hardness can be changed by heat treating and controlling the rate of cooling. Characteristics of various electrodes and their deposits, and their uses appear in the following tables:

➤ **DIPPER TOOTH** is reclaimed by cutting off old point and welding on new manganese steel point with stainless and manganese electrodes. New point is surfaced on all sides for 3 in. from tip with semi-austenitic material and cutting edge back 1½ in. from tip is finished with tungsten carbide. Stringer beads are run along face and sides and around bolt hole of base tooth with semi-austenitic electrode for abrasion resistance.



## CHARACTERISTICS AND USES OF SURFACING ELECTRODES NOT AFFECTED BY HEAT TREATING

### TUNGSTEN CARBIDE TYPE

**Rod** — Steel tubes containing particles of crushed cast tungsten carbide. Some contain coarse (10 to 40 mesh) particles; others, fine particles (40 to 120 mesh).

**Deposit** — Most highly abrasion resistant material commercially available. Diamond-like granules of tungsten carbide are held in a tough alloy matrix. In use, matrix and base metal wear away exposing hard granules. Edge becomes self-sharpening. Electrode with fine particles gives a thin deposit which wears to a sharper and smoother edge than coarse particle deposit. Fine particles are not undermined by muddy sand abrasion.

**Use** — For earth cutting and digging equipment when material is highly abrasive sand, sandy lime and sandstone. Increased tool life and greater efficiency more than compensates for higher first cost of these electrodes. For: Digger teeth, scraper blades, bits, tool joints, augers, mixing blades, plows, cement mill parts.

### CHROMIUM CARBIDE TYPE

**Rod** — Tube type and cast type electrodes. Tube is lower priced and is made by placing a mixture of powdered metals and ferro alloys in a mild steel tube which is coated for arc stabilization. Some electrodes made without iron (non-ferrous group). Also available as a powder to be applied with the carbon arc.

**Deposit** — Will resist both abrasion and impact. Some are more resistant to one than to the other. Alloyed chromium carbide particles in the deposit give it abrasion resistance and iron alloy matrix gives a good degree of toughness. Tougher and less expensive than tungsten carbide deposits. Non-machinable, they must be finished by grinding. Hardness not appreciably affected by heat treatment. Corrosion resistance good. Non-ferrous group excels in corrosion resistance. Powder type has highest abrasion resistance qualities and lowest impact resistance.

**Use** — When both impact and abrasion (as well as corrosion) are encountered, especially where abrasion is severer than impact. Rod is not satisfactory for building and holding a metal cutting edge. Under some types of sliding wear will polish and wear very slowly. For: Screw conveyors, scarifier teeth, dredge pump castings, crusher rolls, chutes, pulverizer jaws. Powder is used for small parts that are too thin for surfacing with an electrode and where a thin, high abrasion resistant deposit is desired.

### SEMI-AUSTENITIC TYPE

**Rod** — Coated, alloy steel wire electrode.

**Deposit** — Contains approximately 2% carbon with approximately 5% chromium and/or other alloying elements. It is a self-hardening deposit which develops additional hardness when subjected to battering and pounding. It maintains a toughness but hardening only at the surface where it is cold-worked so that a cushion of softer metal remains at all times underneath the surface. This eliminates checking and flaking, common with materials that have high hardness as deposited. Not machinable but can be hot-forged and ground.

**Use** — This type has more uses than any other type and is priced only slightly higher than mild steel electrodes. The excellent combination of toughness and abrasion resistance makes it safe for most any application. Is used for earth cutting tools (not metal cutting) where hammering and pounding are encountered. For: tractor grousers, shovel tracks, pump impellers, screw flights, mill hammers, rock crusher hammers, conveyor rolls.

### HIGH MANGANESE STEELS

**Rod** — These electrodes are either cast, tube or drawn alloy wire type. Coated for AC and DC operation; bare for DC operation only.

**Deposit** — Analysis of a typical deposit will be 0.7% carbon, 12.0 manganese, 1.0 copper, 0.5 molybdenum, with the balance iron. The deposit is very tough and any type of cold-working, hammering or peening, will increase the hardness of the deposit.

**Use** — For resurfacing and building up high manganese steel (12 to 14% manganese), such as is in rail frogs and switches, dipper teeth, dipper lips and parts of crushers. Carbon steel can be built up with manganese steel to give a surface with the properties of manganese steel.

### STAINLESS STEEL TYPE

**Rod** — Coated alloy steel wire electrode. Coating is low hydrogen type.

**Deposit** — Has lower abrasion resistance qualities than other four types. Will work harden and, together with corrosion resistance qualities, makes a useful tough deposit. Weld metal has high strength, low admixture with parent metal.



**Use** — Because of quality of deposit and low hydrogen coating strength, welds can be made with stainless electrode under the following conditions:

A. Repairing broken parts made of high carbon or high alloy steels.

B. Repairing broken manganese steel parts. Stainless will give a stronger repair than will manganese electrode. Repair should be made completely with stainless where joint is critical. Otherwise edges of joints can be buttered with stainless and the joint completed with manganese.

C. Welding carbon steel to manganese steel by but-

tering edges with stainless and finishing with manganese.

D. Rebuilding of worn areas on hot-working or hot-forging dies.

E. As a base layer on which another surfacing material such as semi-austenitic can be built up. Can be used on hard-to-weld steels with a minimum preheat and in many cases without any.

Stainless 25-20 is recommended for welds requiring strength and stainless 19-9 is satisfactory for depositing a layer on which another hard surfacing electrode is to be deposited.

## CHARACTERISTICS AND USES OF SURFACING MATERIALS THAT CAN BE HEAT TREATED

(Classed according to core wire material)

### HIGH CARBON STEEL TYPE

**Rod and Deposit** — Electrodes are available to deposit material that has a wide range of carbon content (0.3 to 0.8% carbon). Hardness depends on amount of carbon in the deposit and rate of cooling. The deposits may be heat-treated and hot-forged.

**Use** — For building up worn areas prior to application of a more abrasion-resistant material, for replacing metal on parts that must be machined, flame-hardened or otherwise heat-treated. Typical applications: mine car wheels, crane wheels, shafts, sprockets, wobblers, dredging spuds and drilling tools.

### MEDIUM CARBON STEEL

*With Alloying Elements*

**Rod and Deposit** — These electrodes give a narrower spread of hardness, as welded, than obtained with straight carbon electrodes. For the same Rockwell hardness, the electrodes in this group form deposits that are tougher and more resistant to abrasion than the deposits obtained with the high carbon electrodes.

**Use** — Typical applications are: mine rails, wheel flanges, blower blades, crusher pads, caterpillar treads, cams, forming dies, conveyor buckets, track links and drive sprockets.

### TOOL AND DIE STEEL TYPE

**Rod and Deposit** — There is much unnecessary confusion in the use of this type of electrode, for manufacturers have produced nearly as many different elec-

trodes as there are types of tool and die steel. It is not necessary to resurface or to rebuild dies with an electrode that deposits metal of the same chemical analysis as the die. Properties desired in the weld deposit are surface properties only and if these are obtained the chemical analysis of the deposit is of no importance. For example, it is not necessary to use an electrode that will deposit metal capable of hardening to the center of a 3-in. section when it is intended to build up a surface only  $\frac{1}{8}$  in. thick. The 5% chromium type of electrode is satisfactory for most tool and die steel surfacing, with the exception of cases where a high speed type deposit is required. The deposit can be air or oil quenched and given a wide range of heat treatments to produce the desired surface properties.

**Use** — This electrode gives a dense deposit of high tensile strength that resists metal to metal wear, holds an edge and resists failure and deformation under impact. It is used for repair of dies and tools and for building tools by means of a mild steel base metal and the 5% chromium tool steel at the points of wear.

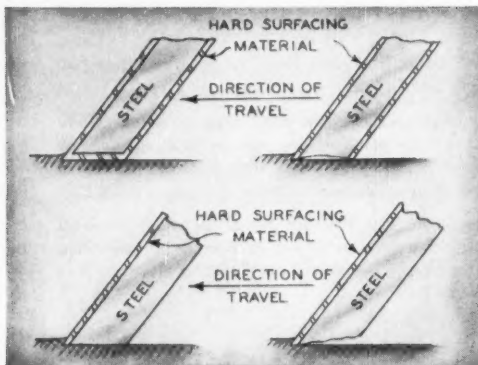
### HIGH SPEED STEEL TYPE

**Rod and Deposit** — Most of the electrodes of this type are of molybdenum type high-speed tool steel. They may be satisfactorily used as welded, may be tempered or may be given high-speed steel heat treatment.

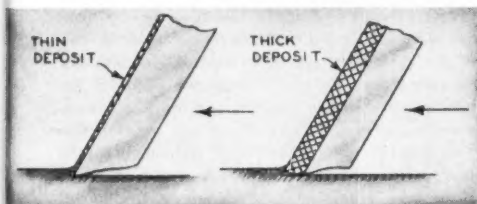
**Use** — They are used for economical fabrication of special tools with use of a low priced base metal and application of a few beads of weld metal to the cutting edge. They are also used for the alteration or reconditioning of lathe tools, centers, shear blades for hot work, broaches and milling cutters.

(Continued on next page)

## ARC-WELD SURFACING . . . Continued



**WRONG AND RIGHT METHODS** of applying surfacing material for self-sharpening edges on earth cutting blades. At top is wrong way, where both sides, or both sides and bottom, of cutting edge are surfaced. By applying surfacing on front face only (bottom view) base metal wears away behind surfacing, keeping cutting edge sharp.



**CHARACTERISTICS** of cutting edge can be changed by varying thickness of surfacing material. Thin deposit (left) wears away faster, but gives a sharp edge for best cutting efficiency. Thick deposit (right) lasts longer, but edge rounds off with wear, decreasing cutting speed.

### How to Select Best Electrode

Many and various combinations of types and intensity of wear make it impossible to recommend specific electrodes. Each job to be surfaced must be studied to determine the kind of wear and the service requirements of the part. Cost of electrode and welding must be balanced against performance and availability of equipment for repair.

Practically all surfacing materials are composed of two constituents: hard crystals and the bond or matrix. Various combinations of properties are possible by changing the size, shape and composition of the hard ingredients and by changing the properties of the matrix. A deposit containing fine granules of tungsten carbide in a soft matrix will show a low hardness, yet will be more resistant to abrasion than a homogeneous material very much harder on the Rockwell or Brinell scale.

Usually a combination of impact and abrasion is the cause of wear. It is necessary to determine which of the two types of wear is relatively more important and to select an electrode to meet the existing conditions.

Often the specific surfacing requirements will dictate the choice of electrode, or at least will eliminate certain types of rod. Here are a few examples:

(1) If the weld must be machinable, the choice is narrowed to one or two electrodes of the high carbon or medium carbon low alloy types.

(2) Where the part and the deposit are to be hot-forged, tungsten carbide and chromium carbide types of electrode are eliminated.

(3) A cutting edge for cutting or turning steel calls for an electrode with a high hardness and a high edge strength, limiting the choice to either tool steel or high speed steel electrodes.

(4) If the deposit is to be machined it may be annealed after welding, but then must be hardened by heat treatment. Electrodes eliminated are: stainless, semi-austenitic, tungsten carbide, manganese steel, chromium carbides. Possible electrodes: high carbon, tool steel and some of the medium carbon low alloy steels.

(5) For maximum resistance to grinding abrasion, use one of the tungsten carbide group.

(6) For high resistance to grinding abrasion, but at a lower cost, use an electrode from the chromium carbide group.

Sometimes limiting restrictions may be changed by consideration of alternative electrodes. For example, where machinability is required, the choice may not be limited to a machinable electrode, for possibly a non-machinable electrode and grinding will improve the product and give a lower over-all cost.

### Check Before Total Wear

Whenever possible, examine a surfaced part when it is only partly worn. Examination of a part after it is completely worn is unsatisfactory. Did the surface crumble off or was it scratched off? Is a tougher surface needed or is additional abrasion resistance required? Should a heavier layer of surfacing be used? Should the surfacing be reduced? All of these questions can be answered by examination of a partly worn part and with a knowledge of the surfacing costs and the service requirements.

In case it is impossible to analyze carefully the service conditions, it is always on the safe side to choose a material tougher than is thought to be required. A tough material will not knock or chip off, and will offer some resistance to abrasion. A hard-abrasion-resistant material is more susceptible to chipping, and surfacing material does not do any good when it is knocked off in large pieces.

After some experience is gained in the use of surfacing materials, various combinations of materials can be tried out to improve product performance. For example, on a part which is normally surfaced with a tough semi-austenitic electrode, it may be possible to get additional abrasion resistance without sacrificing resistance to cracking. Fuse a little of the powder chromium carbide material on critical areas where additional protection is needed.

Many jobs that are badly worn are first built up to almost finished size with a high carbon electrode. They are then surfaced with an austenitic rod, and finally a few beads of chromium carbide deposit are placed in spots requiring maximum protection against abrasion.

Regardless of the circumstances, careful analysis of your surfacing problems is well worth while.

## Maintenance Briefs...



### To Keep Sand From Rig

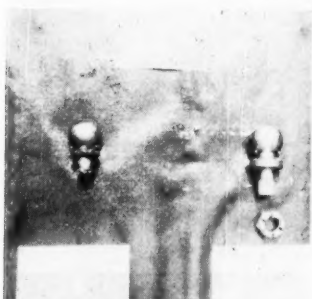
In certain sandy materials, radiator of Allis-Chalmers tractor-shovel plugged up every 4 to 6 days and had to be cleaned and replaced. Main cause was that fan blew air out through radiator instead of sucking it in from front. N. C. State Highway men in Asheboro shop corrected situation by: (1)



Closing front of radiator with metal shield; (2) reversing fan, allowing air to enter through vents at bottom of shield; and (3) welding 12-in. piece of steel full length of rear of bucket to limit spillage. When photo was taken, machine had already been operating four trouble-free months.

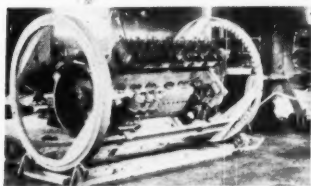
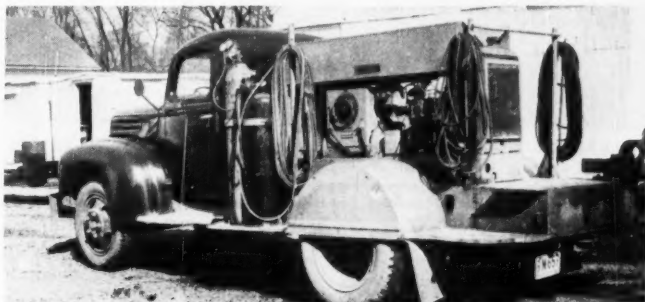
### To Prevent Accidents

At Garrison Dam, when Euclid rolls into field shop for lubrication, wooden barrier is lowered in front of windshield. Driver cannot proceed until all mechanics are safely clear, when bar is raised. Contractor is Morrison-Knudsen & Peter Kiewit, who have earthwork contracts on big Missouri River project.



### To Replace Ball Studs

In North Carolina, loose ball studs on knuckles of state highway department's motor-graders can be replaced quickly without welder's services. Plain ball studs are removed; longer, end-threaded stud with castle nut and cotter pin are substituted.



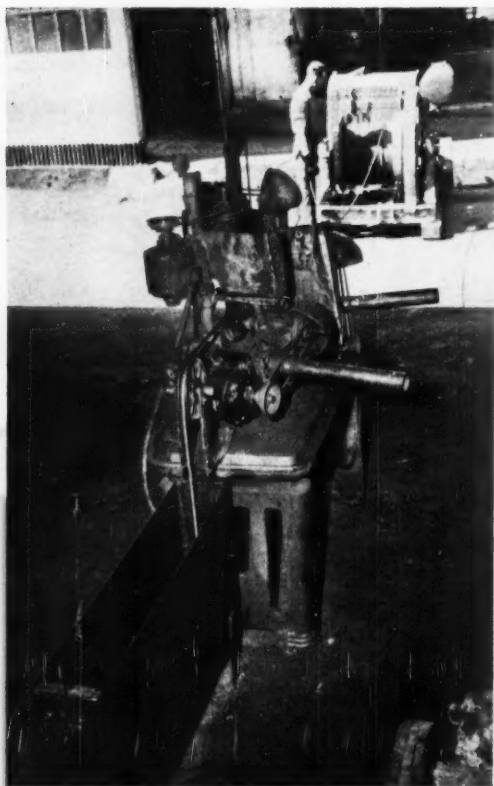
### To Position Engines

In maintenance shop of Syracuse (N.Y.) Supply Co., big equipment distributor, engines are repaired and rebuilt in roller jig. Crank and gear turn clamped engine; hold it at best angle for fastest service.



### To Speed Field Welding

On jobs of W. L. Johnson Construction Co., Columbus, Ohio, owner-built service truck handles both gas and electric welding. Hobart arc welder, gas engine driven, is mounted on flatbed. Closed cabinets on one side carry a good supply of welding rods. Electric cables coil up on hooks at rear. On opposite side are acetylene and oxygen tanks and hose for gas welding. Workbench and vise at rear complete service facilities.

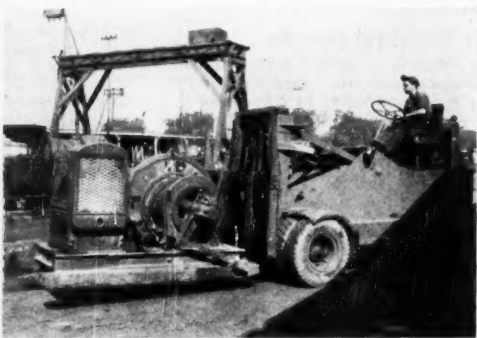


**CABLE RECONDITIONER** at Englewood (N. J.) plant of United Hoisting Co. cleans and lubricates wire rope. Pulled by powered reeler behind camera, cable is scraped by four spinning steel brushes, then passes through oil bath. Numbered photos show details.

## Powered Reconditioner

WHEN YOU HAVE hundreds of hoists with hundreds of thousands of feet of cable, reconditioning the wire rope can be a costly and time-consuming job. So United Hoisting Co. Inc., Englewood, N. J., rigged up an electrically-driven, one-man-operated machine that cleans and lubricates cable at 25 to 30 fpm to reduce reconditioning costs drastically.

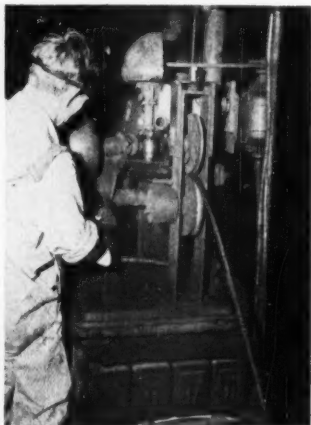
Basically, the apparatus consists of a cleaning machine, a lubricating bath, and a re-spooler that pulls the cable through. The cleaning machine is a four-unit multiple drill stand, war surplus, with Delta drills and General Electric  $\frac{1}{2}$ -hp motors. All drills are fitted with 6-in. stiff wire brushes. The first and third units have been left in their original vertical position and the others have been re-mounted horizontally. They



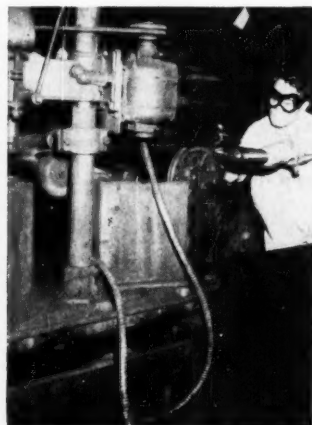
**1 SKID-MOUNTED HOIST** is moved into position directly in front of cable cleaning and lubricating apparatus for straight-line unspooling of  $\frac{5}{8}$ -in. cable from hoist's drum. Ross fork lift truck effortlessly handles Lambert hoist and Hercules engine.



**2 DAMAGED END** of wire rope is snipped off by cable cutter after it has been lightly seized to prevent unstranding. Next, cable will be threaded through sheaves and between brushes of cleaning machine.



**3 CLEANING BRUSHES** are adjusted on drill stands to fit tightly against wire rope so they will clean thoroughly. Cable is centered in machine by pair of sheaves, upper one of which is spring loaded.



**4 WIRE ROPE** is pulled through machine to be passed around sheaves in lubricant tank. Already, brushes are whirring so even first part of cable is cleaned. Operator wears safety goggles and heavy rubber gloves.

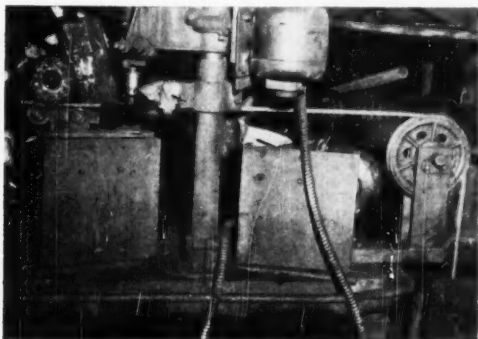


# Cleans Wire Rope Fast

rotate counter to cable travel and are adjusted so the brushes scrape the entire cable surface; sheaves at either end of the stand keeping the wire rope lined up.

After passing through the cleaning machine where all dirt, rust and grease are brushed off, the cable dips through a tank of Keystone No. 3 oil—a combined penetrant and lubricant. Three sheaves within the tank give the cable a reverse flexing so the oil soaks it completely. A pad of felt and cotton waste removes excess oil as the wire rope emerges from the dip tank and passes on to the spooler.

Cleaned and lubricated cable is wound on reels on a three-speed horizontal spindle. It pulls and spools  $\frac{3}{4}$ -in. cable at 25 fpm,  $\frac{5}{8}$ -in. at 30 fpm, and  $\frac{1}{2}$ -in. at 35 fpm. Compare that to a reconditioning by hand!



**6** FOUR WIRE BRUSHES are checked periodically, after machine is stopped, to insure good contact against cable. Each brush is at different position so all sides of cable are cleaned progressively. Wire rope shines even before it dips into oil bath.



**5** POWERED REELER neatly spools cleaned and lubricated cable on to wooden storage reel as operator watches carefully to spot any damaged sections. Piece of cotton waste in his gloved hand snags wire splinters as cable passes through, shows breaks.



**7** FINISHED CABLE is removed from winder to await next job. Loaded reels and drive spindle have been lifted out by chain hoist, and cone nut is backed off to free them. What appears to be dirt on floor is oil-absorbing compound to keep area clean.

## Agile Lube Rig Serves Scattered Equipment

HALF-TRACK lubricating plant completely disregards rocky ground, steep slopes and dense woodland while it services tree-dozers, compressors and rock drills scattered far ahead of road work on the north leg of Atlanta Expressway. When forward equipment proved too inaccessible for regular servicing trucks, MacDougald Construction Co. of Atlanta hit upon plan for this rig. Carrying three 55-gal drums of oil, three more of different weight greases, and a Curtiss air compressor, its versatility on the job is amazing. Emerging from the woods, it also services three "Cat" bulldozers, two "Cat" scrapers, ten end-dump Euclids, two Allis-Chalmers tractors, two  $2\frac{1}{2}$ -yd Northwest shovels, a Lorain Moto-crane and a Northwest backhoe.



# • Even SMALL CONTRACTORS can operate an effective

## preventive maintenance plan if they...

MANY CONTRACTORS, both large and small, devote only token attention to equipment lubrication—the key item in any preventive maintenance program. Data provided to the contractor by the manufacturer and the equipment distributor are handed to the master mechanic or operator with the suggestion that “we ought to take good care of this piece of equipment.” But many times preventive maintenance ends there.

Most oil companies offer expert advice and help in laying out lubrication programs. Contractors should take advantage of this service. Too often they don't. Some of the oil firms even provide systematic record-keeping systems that help to make sure good lubrication procedures are carried out. Such systems not only keep tab on lubrication and repairs but are excellent means of keeping accurate cost data on equipment.

The Fleet Service Plan of Standard Oil Company of California is one of the best such services available. It is typical of programs carried out by oil companies in all sections of the country.

Basic in Standard's program are two items: Personal service by lubrication engineers, and a complete set of forms for effective record keeping and cost analysis.

When called in by a contractor, the lubrication engineer will discuss with him or his master mechanic their maintenance practices. Then, based on considerable experience with similar lubrication problems, the engineer will point to places where the contractor's maintenance procedure falls down. Suggestions for corrective measures are given.

Of course, these lubrication engineers can also be called on for consultation about a specific problem. However, a contractor has nothing to lose and plenty to gain if his entire system is given a going-over.

Many times, the lubrication engineer will use as a guide an individualized lubrication record sheet that includes both a lubrication diagram and space for recording service data. Standard of California has these forms avail-

FS-2

## STANDARD FLEET SERVICE INDIVID

| CRANKCASE              |                            |               |               |                              | TRANSMISSION—AUX. TRANS.—TORQUE DIVIDER |               |               |                              |  | DIFFERENTIAL |               |               |                              |  |
|------------------------|----------------------------|---------------|---------------|------------------------------|---|---------------|---------------|------------------------------|--|--------------|---------------|---------------|------------------------------|--|
| MODELS                 | Heavy Duty or Above<br>SAE | Summer<br>SAE | Winter<br>SAE | Winter Below<br>10° F<br>SAE | MODELS                                  | Summer<br>SAE | Winter<br>SAE | Winter Below<br>10° F<br>SAE |  | MODELS       | Summer<br>SAE | Winter<br>SAE | Winter Below<br>10° F<br>SAE |  |
| All Gasoline Engines   | 40                         | 30            | 20            | 10                           | All Units                               | 140 GO        | 90 GO         | 80 GO                        |  | All Units    | 140 GO        | 90 GO         | 80 GO                        |  |
| Cummins Diesel Engines | *10, 40                    | *30           | *20           | *10                          |   |               |               |                              |  |              |               |               |                              |  |

GASOLINE ENGINES  
WA-2064, WA-2264  
WA-3464, 12 Qts.  
720, 720T, 722, 18 Qts.

DIESEL ENGINES  
Cummins 110-B, 18 Qts.  
110-B-4, 20 Qts.

TRANSMISSION  
WA-2264, 11 Lbs.  
WA-2264, WA-3464, 20 Lbs.  
720, 720T, 722, 20 Lbs.

TORQUE DIVIDER  
WA-2064, WA-2264  
8 or 24 Lbs.  
WA-3464, 24 Lbs.

SPIRAL BEVEL  
WA-2064, 8 Lbs. each.  
WA-2264, 12 Lbs. each.

DOUBLE REDUCTION  
720, 720T, 722, 16 or 22 Lbs.  
WA-3464, 14 Lbs. each.

### AUXILIARY TRANS.

Level of plug. (Some models, upper plug for Winter level, lower plug for Summer level.)

\*Use Diesel engine lubricating oil.

### FRONT END POINTS

| LUBRICANT    | INTERVAL | APPLICATION POINT       |
|--------------|----------|-------------------------|
| Ch. Gr.      | 1000 mi. | SPRING SHACKLE          |
| Wh. Brg. Gr. | 1000 mi. | *BRAKE CAM SHAFT        |
| Ch. Gr.      | 1000 mi. | *KING PIN               |
| Ch. Gr.      | 1000 mi. | *TIE ROD                |
| Wh. Brg. Gr. | 1000 mi. | *BRAKE SHOE ANCHOR PINS |
| Ch. Gr.      | 1000 mi. | *DRAG LINK              |
| Ch. Gr.      | 1000 mi. | *SPRING BOLT            |

### UNDER HOOD POINTS

|                            |          |                                     |
|----------------------------|----------|-------------------------------------|
| Wh. Brg. Gr.               | 1000 mi. | FAN (720, 720T, 722 only)           |
| Ch. Gr.                    | 1000 mi. | *ENG. SUPPORT (720, 720T, 722 only) |
| E. O. 4 drops              | 1000 mi. | *DISTRIBUTOR                        |
| H. O. saturate wick        | 1000 mi. |                                     |
| E. O. or D. O. (See table) | 1000 mi. | CRANKCASE                           |
| H. O. 4 drops              | 1000 mi. | GENERATOR                           |
| Gear Gr.                   | 2000 mi. | *STEERING GEAR                      |
| Wh. P. Gr. (2 turns cup)   | 1000 mi. | *WATER PUMP (720, 720T, 722 only)   |
| H. O. 4 drops              | 1000 mi. | *STARTER                            |

### CENTER CHASSIS POINTS

|                      |          |                                      |
|----------------------|----------|--------------------------------------|
| Ch. Gr.              | 1000 mi. | PEDAL BEGS.                          |
| Ch. Gr.              | 1000 mi. | *BRAKE APPL. CATION VALVE            |
| Gear Oil (See table) | 1000 mi. | TRANSMISSION, AUXILIARY TRANSMISSION |
| Ch. Gr.              | 1000 mi. | HAND BRAKE SHOE PINS                 |
| Gear Oil SAE 140     | 2000 mi. | *UNIVERSAL JOINTS                    |
| Ch. Gr.              | 1000 mi. | HAND BRAKE CROSS SHAFT               |
| Ch. Gr.              | 1000 mi. | SHAFT SPLINE                         |

### REAR END POINTS

|  |          |                         |
|--|----------|-------------------------|
| Ch. Gr.  | 1000 mi. | SPRING SHACKLE          |
| Gear Oil SAE 140   | 2000 mi. | *UNIVERSAL JOINT        |
| Gear Oil (See table)   | 1000 mi. | DIFFERENTIAL            |
| NOTE: Various makes of trailing axle used. Ch. Gr.—1000 mi. at all fittings. |          |                         |
| Wh. Brg. Gr.   | 1000 mi. | *BRAKE CAM SHAFT        |
| Wh. Brg. Gr. 2 strokes cup   | 1000 mi. | *BRAKE SHOE ANCHOR PINS |

SYMBOLS appearing with model number on truck identification plate signify the following:  
SA—Gas chassis T—Tractor

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LITHO IN U.S.A.  
CODE W-1-T

CAPACITY DATA: Data shown are for standard equipment and common options. Always verify correct level of lubricant as indicated by bayonet gauge or level plug.

### INDIVIDUALIZED SERVICE NOTES

\*BRAKE CAM SHAFT: (Slack Adjuster) Fittings—Ch. Gr.—1000 mi. Others, pack at assembly.  
\*DISTRIBUTOR: (With Grease Cup) Wh. Brg. Gr.—1000 mi. 1 turn cup. H. O.—saturate wick.  
\*STEERING GEAR: Fill until lubricant comes out vent hole. Avoid pressure.  
\*WATER PUMP: (Outboard Gear) Ch. Gr.—1000 mi.  
\*STARTER: (With Reduction Gear) Repack with Ch. Gr.—twice a year.  
\*BRAKE APPLICATION VALVE: (With Oiler) 20 drops E. O. SAE 20 or 30—1000 mi.  
\*UNIVERSAL JOINTS: Fill until lubricant comes out vent. Avoid pressure.

### SPECIAL LUBRICATION POINTS

CLUTCH (WA Models): (Release Brg.) E. O.—500 mi., 10 or 15 drops. (Release Shaft) Ch. Gr.—1000 mi.  
WEAR SPRING SEATS (WA Models Only) Gear Oil SAE 90—1000 mi.  
PROPELLER SHAFT SUPPORT BEARING: Wh. Brg. Gr.—1000 mi.  
WET TYPE CLUTCH (Models 720, 720T): Drain, clean—2000 mi. Reoil with 1 qt. E. O. SAE 20.  
FRONT & REAR WHEEL BEARINGS: Wh. Brg. Gr.—2000 mi. Remove, clean, and repack both inner and outer bearings.  
CUMMINS DIESEL ENGINE: (Fan, Water Pump) Wh. Brg. Gr.—5000 mi. (Fuel Injection Pump) Lubricated by fuel. (Clutch Release Bearing) Wheel Brg. Gr.—1000 mi., 2 strokes of grease gun.  
AIR BRAKES: (Compressor) Separately Lubricated E. O.—check level daily. Drain and refill when draining crankcase. Some models lubricated from engine. (Brake Chambers) Replace boot if damaged.  
BRAKE AIR CLEANER: Service every 4000 mi., often in dusty conditions. Kerosene wash element, dry, reoil with light E. O.  
VACUUM BRAKES: (Relay Lever) Ch. Gr.—1000 mi. (Cylinders) 2 or 3. Vac. Cyl. oil through plug holes every 4000 mi. Disconnect clevis, work piston. Replace boot if damaged.  
SPRING LEAVES: P. O.—1000 mi., on tips.  
CONTROL LINKAGE: E. O.—1000 mi.—on clevis pins and bearings. Do not oil rubber bushings.

### SHOCK ABSORBERS

Link Fittings—Ch. Gr.—1000 mi. Inspect for broken linkage, examine for leaks every 1000 mi. Service every 10,000 mi. or when leaking.

### AIR CLEANERS

OIL-BATH TYPE: Service every 2000 mi., often in dusty conditions. Remove, wash cup and element, drain dry. Fill cup to level mark with E. O. SAE 30. Summer—SAE 20. Winter: Clean the air tube to engine. When assembling make certain all connections are tight.  
CRANKCASE BREATHER: Inspect frequently. Remove wash drain dry, reoil, drain excess.

## WHITE CONVENTIONAL AND 6-WHEEL TRUCKS

MODELS 720, 720T, 722, WA-2064, WA-2264, WA-3464  
1942-43 Lubrication Recommendations

LUBRICATION DIAGRAM in chart form details all points to be serviced, along with recommended lubricant and lubrication interval. On original, arrows are printed in red for ease in locating part. Reverse side of record form is continuation of check sheet on face, with space for additional 20,000 mi. Standard of California provides record forms for each piece of equipment.

# Look to the Oil Companies for Help

## INDIVIDUALIZED LUBRICATION RECORD

| STARTING MILEAGE                                    | THOUSANDS OF MILES |   |   |   |   |   |   |   |   |    |
|---|--------------------|---|---|---|---|---|---|---|---|----|
|   | 1                  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| SERVICE EVERY 1,000 MILES (CHECK (✓) WHEN SERVICED) |                    |   |   |   |   |   |   |   |   |    |
| CHASSIS LUBRICATION                                 |                    |   |   |   |   |   |   |   |   |    |
| CRANKCASE   |                    |   |   |   |   |   |   |   |   |    |
| TRANSMISSION  |                    |   |   |   |   |   |   |   |   |    |
| AUXILIARY TRANSMISSION                              |                    |   |   |   |   |   |   |   |   |    |
| DIFFERENTIAL  |                    |   |   |   |   |   |   |   |   |    |
| CONTROL LINKAGE                                     |                    |   |   |   |   |   |   |   |   |    |
| STARTER & GENERATOR                                 |                    |   |   |   |   |   |   |   |   |    |
| DISTRIBUTOR   |                    |   |   |   |   |   |   |   |   |    |
| WATER PUMP  |                    |   |   |   |   |   |   |   |   |    |
| STEERING GEAR                                       |                    |   |   |   |   |   |   |   |   |    |
| UNIVERSAL JOINTS                                    |                    |   |   |   |   |   |   |   |   |    |
| TRAILER LUBRICATION                                 |                    |   |   |   |   |   |   |   |   |    |
| SERVICE INTERVAL MILES                              |                    |   |   |   |   |   |   |   |   |    |
| SERVICE OVER 1,000 MILES (CHECK (✓) WHEN SERVICED)  |                    |   |   |   |   |   |   |   |   |    |
| TRANSMISSION  |                    |   |   |   |   |   |   |   |   |    |
| AUXILIARY TRANSMISSION                              |                    |   |   |   |   |   |   |   |   |    |
| DIFFERENTIAL  |                    |   |   |   |   |   |   |   |   |    |
| FRONT WHEEL BEARINGS                                |                    |   |   |   |   |   |   |   |   |    |
| REAR WHEEL BEARINGS                                 |                    |   |   |   |   |   |   |   |   |    |
| OIL FILTER  |                    |   |   |   |   |   |   |   |   |    |
| SHOCK ABSORBERS                                     |                    |   |   |   |   |   |   |   |   |    |
| UNIVERSAL JOINTS                                    |                    |   |   |   |   |   |   |   |   |    |
| STEERING GEAR                                       |                    |   |   |   |   |   |   |   |   |    |
| TRAILER WHEEL BEARINGS                              |                    |   |   |   |   |   |   |   |   |    |
| AIR CLEANER   |                    |   |   |   |   |   |   |   |   |    |
| MECHANIC'S INITIALS                                 |                    |   |   |   |   |   |   |   |   |    |
| DATE  |                    |   |   |   |   |   |   |   |   |    |
| SPEEDOMETER READING WHEN SERVICED                   |                    |   |   |   |   |   |   |   |   |    |
|   | 1                  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| THOUSANDS OF MILES                                  |                    |   |   |   |   |   |   |   |   |    |

EQUIPMENT No.

able for 2,728 truck models, 220 tractor models, and also for other miscellaneous construction equipment. These charts are of fundamental importance in Standard's Fleet Service Plan.

A potential customer is provided with one of these charts for each piece of equipment that he has. As can be seen by the accompanying illustration, this gives all the data necessary for effective upkeep.

The oil companies spend much effort collecting this lubrication information to give their engineers complete and up-to-date data so they can effectively perform their duties. It's only one step further to combining the factory recommendation with a chart, to result in the individualized lubrication record. This is an effective combination of lubrication recommendations and a continuous record of actual service performed.

For less common equipment items, another form is available that omits only the actual lubrication diagram—with other space for this information. Complete individual records for stationary engines or equipment that is serviced on an hourly rather than a mileage basis is kept on still another form designed for this purpose.

Two other forms are used in Standard's Fleet Service Plan to keep data that are valuable in analysis of costs. One is a daily record pad on which the amount of fuel and oil used by each piece of equipment is recorded. The other is an operating cost record card on which is summarized data from the other forms. Reminder stickers for speedometers or door-jams can also be had.

As was stated earlier in this article, the Fleet Service Plan provided by Standard Oil Company of California is merely typical of service rendered by oil companies in all parts of the country. Of course, it helps the companies to sell lubricants. But oil and grease are necessary anyway for effective maintenance. So don't steer shy of the help these firms can give you. Their service can be valuable. And with it, even a small contractor can have effective preventive maintenance.



**Keep a check on your hoist cables and sheaves, because . . .**

## **If Your Hoists Stop, the Job Stops, too**

THERE'S NOTHING THAT gives a job superintendent a sicker feeling than the report that a hoist has broken down. It means delays, re-scheduling, slowdowns—even if it can be repaired quickly.

Starrett Bros. and Eken were determined it wouldn't happen on any of their 54 hoisting setups on the huge Parklabrea housing project in Los Angeles for Metropolitan Life Insurance Co. Each of the eighteen 13-story apartments was scheduled to have a Chicago boom and a double-well tower for cage and bucket. Maintenance of this hoisting equipment was paramount.

Patent Scaffolding Co. erected the 190-ft towers which extend 40 ft above roof grade. A 5,000-lb capacity cage runs in each 6x6-ft square well, flanked by a 1½-yd concrete bucket in the adjoining well. The Chicago booms handle lifts up to 2,000 lb and the whole works is powered at each building by an

electric 75-3E triple-drum American Hoist and Derrick Co. rig.

With a round trip of the buckets to the 6th floor and back in 40 sec and to the 13th and return in 52 sec, and with equal rise and descent speeds for the cages, it's easy to see how a breakdown, however slight, would back up the flow of materials. (Drums are lagged at the 6th floor mark; the increased diameter thus speeding travel above that point and keeping the round trip under 60 sec.)

Cables pass through three 20-in. fairlead sheaves at the bottom of each tower. These are mounted on 2-in. shafts in separate steel frames. A 2¼-in. bearing surface proved satisfactory for these bottom sheaves, and their location made them easy to inspect and lubricate.

Cathead sheaves are also 20 in., but due to the combination of heavier loads and high travel speeds,

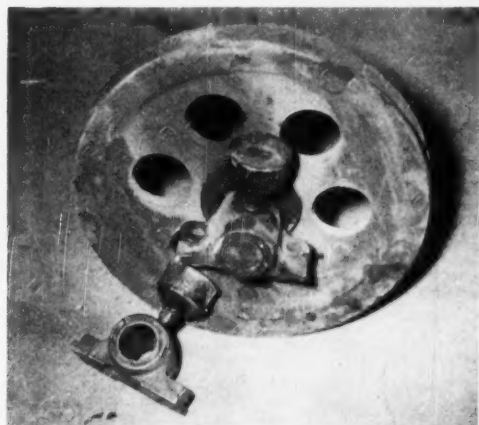




**FAIRLEAD SHEAVES** at base of each tower turn on 2-in. shafts with  $\frac{2}{4}$ -in. bearing surface. Prompt replacement of sheaves with corrugated markings (right) greatly minimizes cable wear.



**MOUNTED IN SEPARATE FRAMES**, fairleads are lubricated with grease cups or through Zerk fittings in hollow shafts, as shown. Grease is stored in center, passing through grooves in bronze bearings.



**WHEN BEARING SURFACE** proved insufficient for cathead sheaves they were sweated to shafts which turn in two 4-in. pillow blocks equipped with self-lubricating bearings and grease cups.

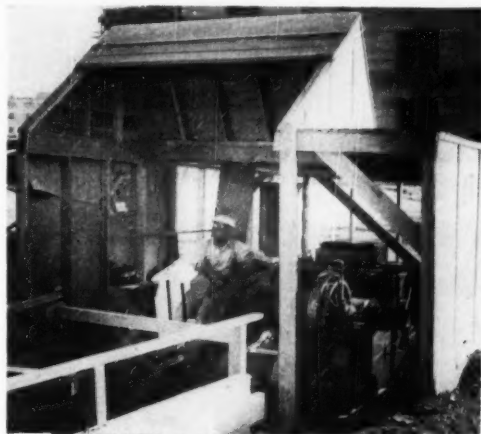
All photos by James Joseph

it was found that the  $\frac{2}{4}$ -in. bearing surface was not sufficient. So the contractor disassembled the catheads, sweated the sheaves to 2-in. shafts,  $10\frac{1}{2}$  in. long, and ran each rotating shaft through two pillow blocks with a combined bearing surface of 8 in. Self-lubricating bronze bearings were inserted in the pillow blocks and 5-oz grease cups attached. Friction of the rotating shafts heats the blocks enough to thin the grease and keep the bearing surfaces bathed.

### Cast Steel Sheaves Replace Iron

One by one the bugs were ironed out. Wide-grooved sheaves which permitted a slapping effect on the cable were replaced with others of proper groove size. (Manufacturers recommend  $\frac{1}{8}$  in. larger than rope diameter.) Excessive groove markings and wear on cast-iron sheaves prompted their exchange to steel castings. Riggers regularly inspect cathead grease cups before each pour, which averages 550 yd.

Now, after two full years of operation, the time and expense of hoist maintenance has paid off, since there have been no serious failures or breakdowns in all that time.

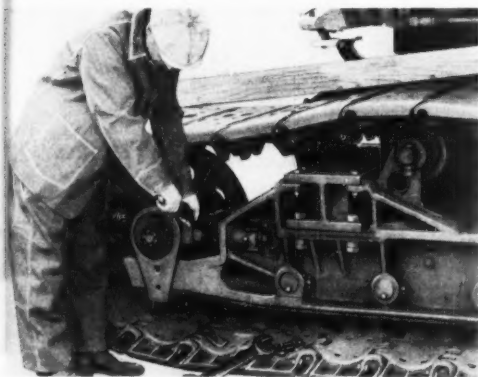


**TRIPLE-DRUM RIGS** power each of eighteen hoist setups. Top spool carries  $\frac{3}{8}$ -in. cable for Chicago boom, center and bottom drums handle  $\frac{3}{4}$ -in. for materials cage and concrete bucket. Maintenance paid off here, with no serious breakdowns in two years.

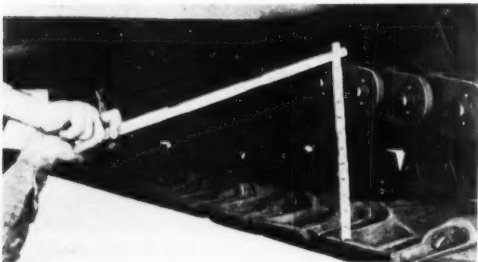
## GOOD ADVICE FROM THE MANUFACTURER



SHOVELS ARE BUILT for rugged service, yet preventive maintenance on these expensive rigs will help keep up their efficiency, keep them operating, and reduce major repairs.



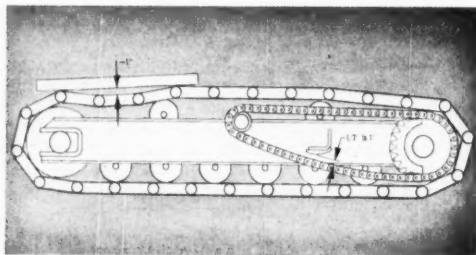
CRAWLER TREAD BELT is tightened by adjusting front end idler.



HERE is the way to check crawler drive chain for correct adjustment. For long life crawler service, be sure drive chain and tread

## ... Cranes and Shovels

If you know your machine, follow manufacturers' recommendations, give it proper inspection and testing, use it correctly, lubricate it well and promptly repair small troubles, you will get maximum service from these expensive units.



belt tension (above) are properly maintained. Typical limits are shown here.



**DRAGLINES** also see rough service. The owner of this machine practices preventive maintenance, as can be seen from neat array of proper lubricants and pressure gun on catwalk.

IT IS AXIOMATIC that the better care given to any machinery the longer it will last, and that is particularly true of power shovels, cranes, clamshells and draglines. In fact, the giving of such care and attention is today well understood and is generally referred to as Preventive Maintenance. This term may be defined simply as doing those things which eliminate machine failure and loss of efficiency over and above the ordinary and unavoidable wear and tear of regular operation.

This definition is an all-inclusive one as Preventive Maintenance is not a separate, individual function or operation, carried out independently of all others. Rather, Preventive Maintenance is not limited, but is a part of many operations. It can and should be practiced in a number of ways and be incorporated into items such as: (1) Proper inspection and testing of the machine prior to operation; (2) Proper set-up of the machine on the job in a manner that doesn't work undue hardships on the machine; (3) Careful and proper operation; (4) Proper adjustments, regularly made; (5) Correct lubrication, as to schedule and lubricants; (6)

By **J. L. BELTZ**  
Manager Sales Promotion  
Thew Shovel Co., Lorain, Ohio

Keeping an eye on the general welfare of the machine so development of difficulties which may lead to major breakdowns and repairs are caught in time and remedied, or other corrective action taken.

Many do not realize that Preventive Maintenance is a part of each of these and must be practiced in all of them if a sound maintenance is to result. The purpose of this article is to show the relationship of all these operations to Preventive Maintenance.

### First, Know Your Machine

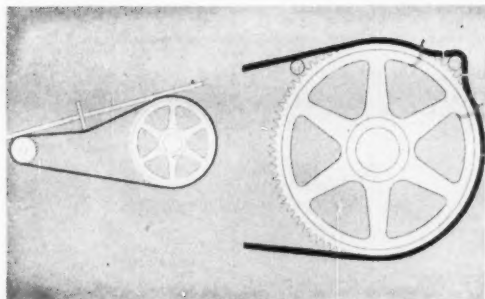
A competent operator may get off one make of machine and on to another with which he is not fully acquainted and do a good job of operation. It is doubtful, however, if he can apply Preventive Maintenance to the new machine in the sense we are using it here. This is because even though the end operations of all shovels and cranes are the same, the methods of achieving them through power

transmission, clutches, brakes, etc. are not the same for all machines.

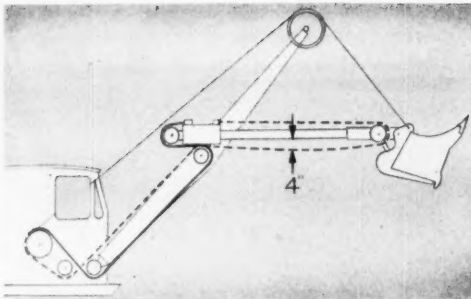
Our advice to an operator taking over the levers of a strange machine is: "First, know your machine." Most shovel and crane manufacturers today publish a handbook or instruction book covering their project. Anyone not fully acquainted with the machine should first become conversant with the contents of the manufacturer's handbook.

In it he will find recommendations for many items that will bear heavily on Preventive Maintenance. He will find suggestions on approved methods of operation; the best available information on when and how to adjust the machine; many time-saving shortcuts on how to accomplish these; the correct lubrication instructions as to schedule and types of lubricants; and many other helpful hints that will keep the shovel or crane going longer, with fewer time losses.

These instruction manuals are costly to the manufacturers. It is to be regretted they do not always receive attention they are entitled to in view of their important contribution to Preventive Maintenance.



**PROPER METHOD** of determining if roller chain needs adjustment is shown at left. At right is way to break chain to insert take-up link. Roller is placed between chain and sprocket, then sprocket



is rotated quarter turn and chain is seized at both sides of roller. Proper limit for adjustment of crowd and retract cables on a shovel is illustrated directly above.

nance by taking much of it out of the realm of guess and putting it into the category of knowledge.

### Proper Inspection and Testing

This subject covers many items and no attempt will be made here to go into extreme detail. Many of such items require no more than your own good common sense in checking them before you start to operate. Here are a few major suggestions:

(1) Check engine oil level, fuel tank and coolant in radiator (use anti-freeze as per manufacturer's instructions in cold weather). Fill as necessary. Thoroughly lubricate machine.

(2) Inspect all cables and clamps. Cables should not be frayed or free of lubricant. Cable clamps must all be tight. Be sure cable wedges are secure.

(3) Start engine and check to see that all instrument gages are functioning properly.

(4) Engage engine clutch and test all operations, with light loads if possible. Make all necessary clutch and brake adjustments for suitable operation.

(5) If operating under dusty or dirty conditions, pay special attention to engine air cleaners. Also,

clean and add new oil more frequently than ordinarily called for.

### Job Planning Helps

Many times the manner in which a shovel or crane is set up on the job will affect not only its general performance, but may also influence Preventive Maintenance. Some setups place the machine at a disadvantage where it must work harder, absorb greater stresses, etc. Here are some suggestions to avoid these:

(1) Try to set up machine on firm, level ground if possible. If necessary, build a fill or place timbers to level up. Swinging uphill is exceedingly destructive to swing clutches, and may even affect engine lubrication.

(2) When operating rubber-tire machines, extend and block outriggers securely whenever necessary. Maximum capacities may only be lifted on outriggers.

(3) On crane and clamshell work, try to locate machine so you will not have to work with the boom approaching the maximum safe boom angle.

### Careful Operation Pays Off

Many of the items which may be classed as good or safe operations also have a bearing on Preventive Maintenance. Here are some of them:

#### Cranes

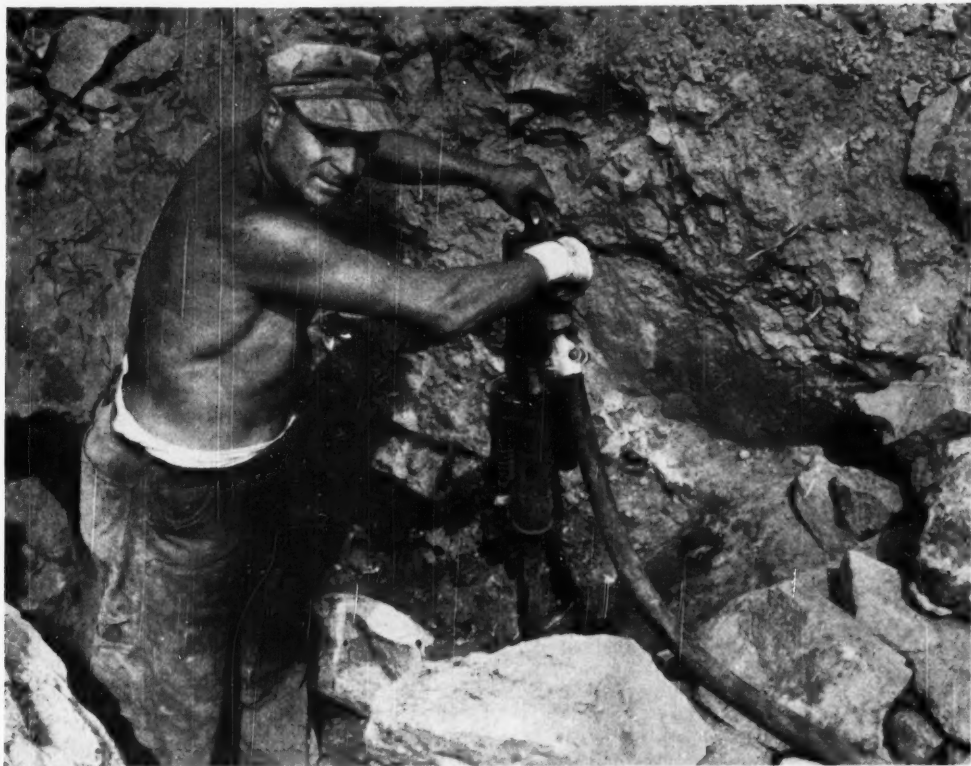
(1) If there is any question about the load to be lifted or about your footing, check the safe stability of the crane.

a. Make certain that the mount-  
(Continued on page 114)



**ON CROSS-COUNTRY PIPELINES**, construction distances are great, working locations are often remote. Delays become extremely costly because of effect on other operations. Therefore, pipeline contractors are past masters at practicing preventive maintenance.





**Because of the work it has to do, the rock drill is built for rugged service, yet it is a precision tool and as such deserves decent care for high operating efficiency.**

## **... Rock Drills**

By THEODORE SLAGER, JR.

Ingersoll-Rand Co., Phillipsburg, N. J.

THE OLD ADAGE, "A stitch in time saves nine," certainly applies to rock drills. These are precision tools, yet they are designed to do rough work and to stand up under hard service. They do not require coddling, but they do deserve good treatment. Operating and repair costs can be kept to a minimum and best results obtained by proper drill care and use.

Modern rock drills strike up to 2,200 blows per min. Probably no tool in general service undergoes so much punishment. Because of the ceaseless pounding they must endure, each essential part is made

of a high-grade steel that best meets the particular requirement. Special heat treating makes the parts highly resistant to shock and wear. Working parts are often ground to tolerances of less than one thousandth of an inch.

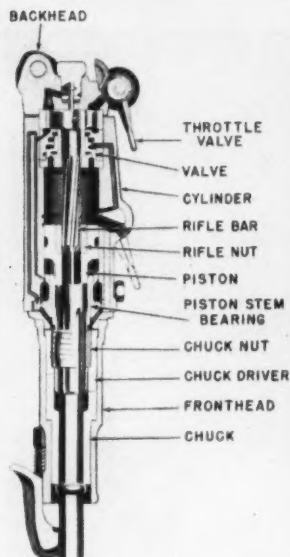
Intense heat is generated in a rock drill when run dry for even a few minutes. This heat destroys the hardness of the parts, and often causes extremely fine cracks usually not visible to the naked eye. A definite schedule of inspection and lubrication should always be set up and religiously followed to keep drills in proper working order.

### **What Happens When Lubrication Is Neglected**

**Rifle Bar**—Lack of lubrication may burn the rifle bar, cause it to break prematurely, gouge out the rifle nut and tie up the drill. The bar may also bind in the valve chest or cause misalignment of internal parts that easily stalls the drill.

**Rifle Nut**—The rifle nut especially must receive ample lubrication. If the machine is run for any length of time without oil, the friction heat caused by bearing of rifle nut on rifle bar flutes quickly destroys the rifle nut.

**Piston**—Oil is vital to protection of piston and cylinder, especially so because of the small clearance between these parts. Without oil, piston becomes scored and seizes, and resulting friction heat causes small checks and scoring. Premature breakage of the piston occurs, and



**KNOW YOUR DRILLS!** Here is a cross-section of a modern Jackhammer showing various essential parts and their relation to each other. Each part is of special steel.

the cylinder is also usually badly damaged.

**Piston - Stem Cushion Bearing** — The protective air cushion in front end of drill is obtained by close fit between piston and piston-stem cushion bearing. Lack of oil leads to rapid wear of parts and the destruction of this close fit. Piston then hits fronthhead and may cause

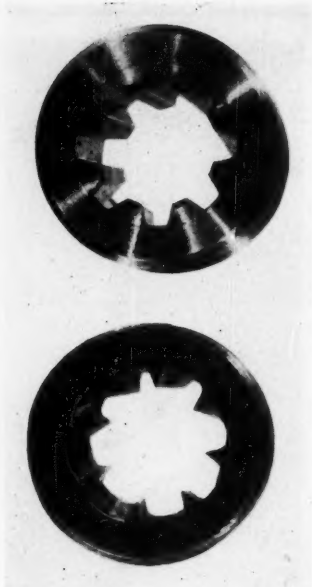


**LACK OF LUBRICATION** cracked this rifle bar. Cracks, result of friction heat, cause premature breakage. The best of steels can't stand up under such neglect.

breakage of throughbolts, front-head parts and even piston itself.

**Chuck Nut**—If the chuck nut is not lubricated, it will wear rapidly and impair rotation. Lack of oil also may burn the piston flutes and cause breakage.

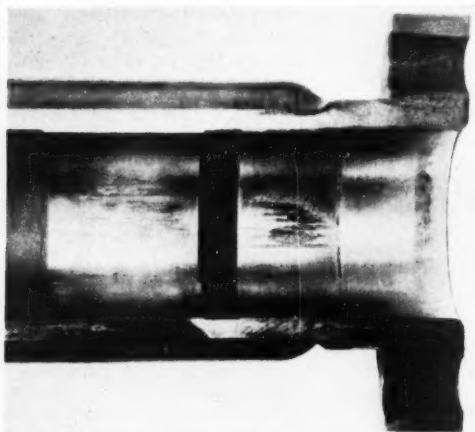
**Chuck Driver**—In wet drills, the chuck driver is often subjected to



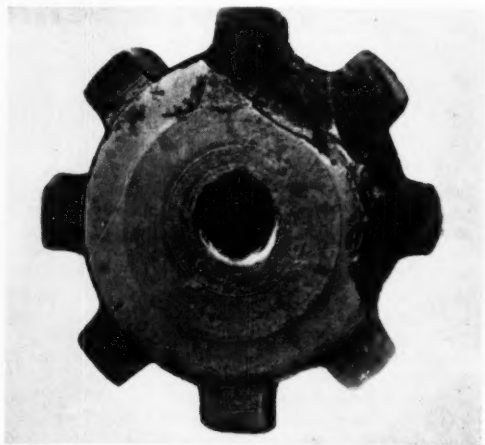
**COMPARISON** of new rifle nut and one that has been rapidly worn out from lack of lubrication shows why drill care is essential to efficient operation.

an excessive amount of water which tends to wash out the oil. Lubricant, therefore, must be supplied constantly to the fronthhead parts. Lack of it causes abnormal wear, scoring, seizing and ultimate breakage.

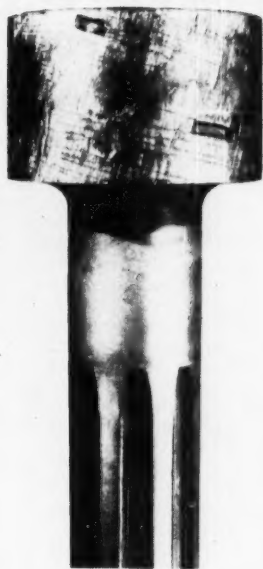
**Chuck**—If the drill is kept clean and lubricated correctly, the chuck should give long service. Otherwise,



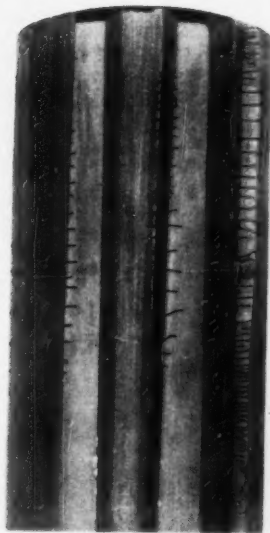
**SAME OLD STORY!** Lack of lubrication causes scoring of cylinder walls, disrupting close clearances between piston and cylinder essential to good operation.



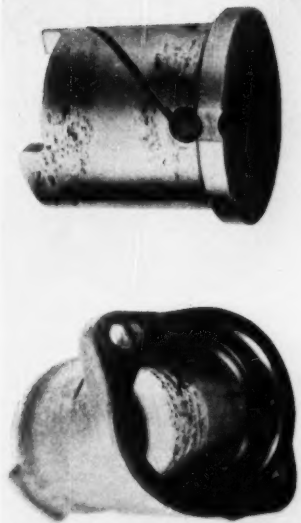
**HERE'S WHAT HAPPENS** to a rock drill piston when chucks are used after being worn to danger point. Excessive chuck wear is mostly due to faulty lubrication.



**SCORING AND CHECKING** of piston head caused by lack of oil between piston and cylinder. Note how intense heat has caused pieces of steel to lift out of piston surface.



**PISTON FLUTES** cracked by friction heat due to lack of oil on piston and chuck nut. These cracks may be invisible to human eye, but etching shows them up.



**SECTION OF CHUCK DRIVER** scored by lack of lubrication that also caused pitting of front head. Scoring lowers drill efficiency and leads to premature breakage.

wear is bound to occur. If the drill steel shanks are covered with oil when they are removed from the drills, it is proof that the chuck parts are receiving ample lubrication.

**Cylinder**—The inner surfaces of a drill cylinder are case-hardened and the clearance between them and the piston is close. Hence, lack

of oil causes scoring which tends to stall the drill and damage the cylinder.

#### Rock Drill Lubrication Systems

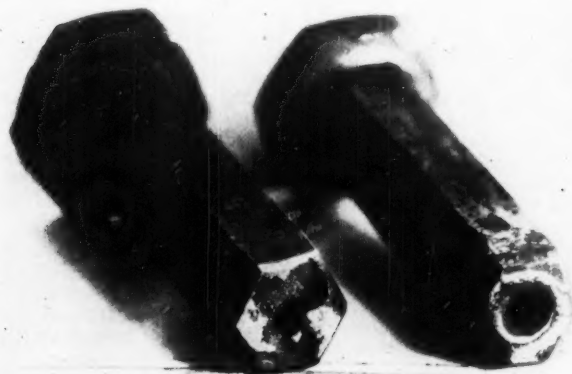
Good integral lubrication systems have been built into most rock drills. If the oil reservoir is refilled every 2 or 3 hr, adequate lubrication is to be expected. However,

the human element enters into the picture, and filling is often neglected or overlooked, especially in intermittent operation. For this reason, air-line lubricators are recommended for use with every type of rock drill. Reliable line lubricators properly serviced usually provide ample lubrication for a shift. They are available in several sizes for different size drills. They should be placed not more than 10 ft from the drill. If a drill is receiving proper lubrication, oil will appear on the drill steel shanks. Lubricators also should be periodically sent to the shop for cleaning out and resetting.

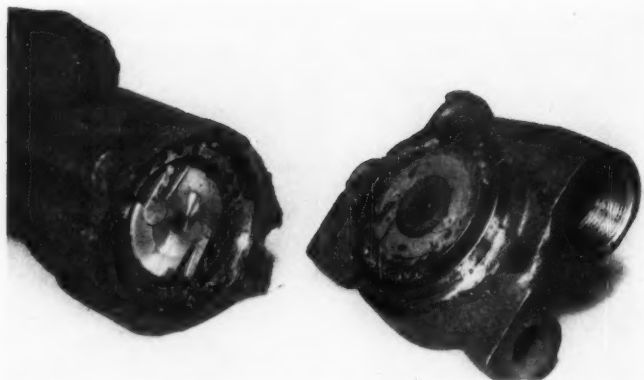
Not any old oil will do, for the lubrication requirements of rock drills are peculiar. The oil must have high film strength, must flow properly, emulsify with water, and must not be easily washed off the bearing surfaces by water or air. Use only rock drill oil recommended by the drill manufacturer. He has spent thousands of dollars on research to find you the best oil possible.

#### Worn Parts Cause Trouble

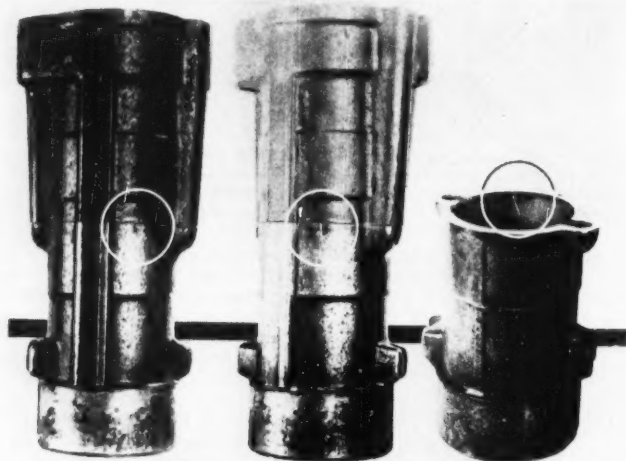
The best steels obtainable are used for the principal wearing parts of rock drills. However, the service of a rock drill is so severe that no  
(Continued on page 64)



**SHANK BREAKAGE** caused by improper finishing of shank face. Shanks must be ground square to avoid trouble such as this. Round-end shanks also damage drill pistons.



PIECES OF ROTTED HOSE lodged in backhead and valve chest of rock drill. Worn out hose not only leaks valuable air, but clogs up the insides of drills, greatly reducing their efficiency.



HEAVY BLOWS on rock-drill cylinder to loosen stuck steel cause this damage: Dent in cylinder (left); outside crack in dent (center) and extension of crack to inside of cylinder (right) revealed by magnaflox.

(Continued from page 63)  
steel can withstand it indefinitely. As wearing of one part affects others, it is advisable to make replacements as soon as they are needed. Do not wait until major repairs have to be made. Above all, do not leave rock drills on the job until they just refuse to run. Two good rules to follow are:

- (1) Have drills inspected at regular intervals.
- (2) Replace worn out parts before they cause trouble.

**Watch the Chuck**—If the chuck or fronthead are badly worn, the drill steel presents an angle to the face of the piston or anvil block. Drilling speed drops off, anvil blocks or pistons are chipped or worn rapid-

ly, and drill steel is broken. When the chuck is worn, the steel is no longer held in line with the piston. Instead of striking square blows on the end of the drill steel shank, the piston may strike the edges of the shank. This soon causes spalling of the piston or shank. Worn chucks is one of the leading causes of piston failure.

A steel used with a worn chuck soon wears round. When next used in a drill with a good chuck, the piston strikes on this relatively small rounded portion of the shank. This promotes breakage of the piston around the central hole.

**Avoid Irregular Shanks and Dull Bits** — The importance of good shanks on drill steel cannot be

overstressed. Standard lengths of shanks are published by the drill manufacturers, and should be strictly adhered to.

A short shank results in decreased drilling speed because the piston will not strike it with full force. A shank that is too long causes short stroking of the piston, and is likewise to be avoided. Above all, shanks should be ground square. Shank grinders are excellent tools developed expressly for this purpose. Also excessive chamfering and countersinking of the center hole on drill steel shanks reduce the striking area and cause piston breakage.

Drilling with dull bits causes more rock drill troubles than is commonly realized. When a bit becomes really dull, only a part of the force of the blow is utilized to cut rock, the remainder must be absorbed by the drill steel and the drill piston. Repeated use of dull bits and the resulting accumulation of shock leads to premature failure of many working parts. Dull bits also are a leading cause of drill steel breakage. Therefore, change bits when they become dull. Bits with inserts of tungsten carbide, such as Carset Jackbits, stay sharp much longer and need resharpening less often, eliminate most of the dull bit troubles.

#### Worn Piston Stem Bearing

Worn piston stem bearings are responsible for much piston breakage. When the drill is raised or backed off while the air is still on, the shank no longer absorbs the full blow of the piston, and the cylinder front washer serves to build up air pressure which cushions the blow. This is accomplished by trapping air between the piston and the piston stem bearings. If the bearing is allowed to wear unduly, it will no longer fulfill this function, and the piston will exert a battering effect resulting in serious damage to both piston and washer.

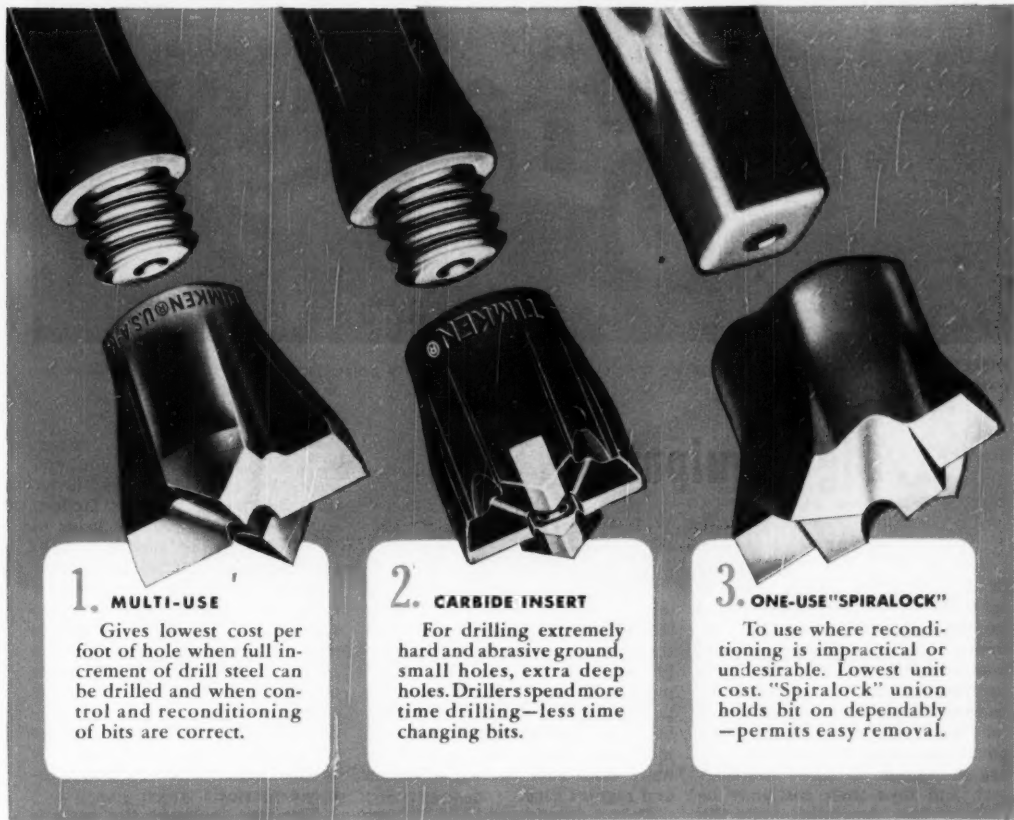
Watch the piston stem bearing closely, as new pistons put in worn machines may fail from this cause.

**Through Bolts**—Through bolts or side rods should be kept tight at all times. A loose bolt affects the operation of the machine. Strains are set up, the machine is slowed down, and the interior moving parts are cramped.

**Hose and Air Pipe Lines**—Old rotten hose and rusty supply lines can cause delays and increase drilling costs. Not only are air leaks due to

(Continued on page 110)

# Only TIMKEN® offers all 3 rock bit types



## 1. MULTI-USE

Gives lowest cost per foot of hole when full increment of drill steel can be drilled and when control and reconditioning of bits are correct.

## 2. CARBIDE INSERT

For drilling extremely hard and abrasive ground, small holes, extra deep holes. Drillers spend more time drilling—less time changing bits.

## 3. ONE-USE "SPIRALOCK"

To use where reconditioning is impractical or undesirable. Lowest unit cost. "Spiralock" union holds bit on dependably—permits easy removal.

## and a complete Rock Bit Engineering Service!

**W**HICH type of rock bit is best for *your* job? Let the Timken Rock Bit Engineering Service help you decide.

Timken Rock Bit Engineers have had years of experience in mining, quarrying, and construction. And with *all three* rock bit types to draw upon, you're sure of getting the bit performance your job demands, whether it be lowest bit cost, lowest cost per foot of hole, greatest possible drilling speed, or any other desired advantage.

Whichever type of Timken bit you select, you are assured of top quality. Every Timken bit is made of Timken electric furnace steel, with uniform hardness for longer wear, better cutting.

**Free Booklet!** For detailed information on Timken removable rock bits, write on your company letterhead for this new Timken booklet. The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".



# TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

**your best bet for the best bit  
... for every job**



## GOOD ADVICE FROM THE MANUFACTURER



THERE'S A LOT of money tied up in those big tires, so preventive maintenance and proper care of tires pay off well.—Caterpillar Tractor Co. Photo.

## ...Big Equipment Tires

By FRANK W. FOX

Goodyear Tire & Rubber Co., Akron, Ohio

IN ANALYZING his construction operations to balance costs against current competitive prices, the smart contractor not only scans major cost items, but also looks to items offering potential savings in costs. Tires are one such item, for though they may be but a small part of the equipment outlay, they are susceptible to abuse and neglect, and thus their cost may be high or low, depending upon the attention they receive.

The difference between good and indifferent care of tires may mean the difference between one and three seasons of service, or between low and high unit cost of material moved. To meet modern construction equipment demands, tires are becoming increasingly larger and more expensive, hence are worthy more than ever of real attention and regular care.

Only a decade ago 18.00-24 tires were about the biggest found on

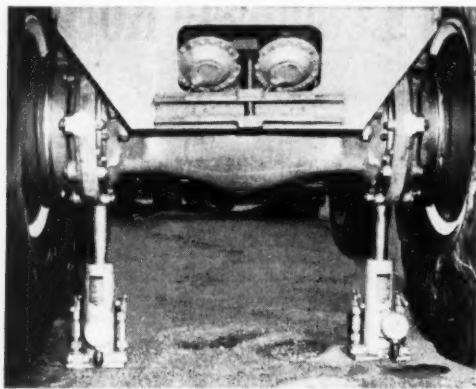
earthmoving equipment. Today, 27.00-33 tires are common, and they carry loads  $2\frac{1}{2}$  times heavier than did the 18.00 size. Modern equipment often imposes loads of 15 to 20 tons upon each tire—tires that cost up to \$10,000 per set.

Goodyear's latest price list, for example, contains 53 construction special items costing from \$600 to more than \$2,800 each. When a contractor realizes that the price of a pick-up truck is tied up in the cost of a single tire, he will endeavor to get the best possible return from his investment by proper supervision and maintenance service.

The way to lower tire costs is neither difficult nor mysterious—

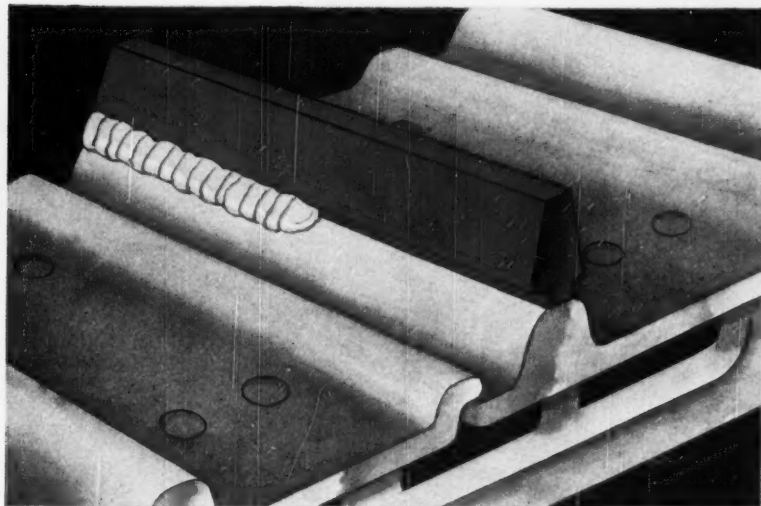


DETAILED INFORMATION on care of big tires is available in a booklet published by the Rubber Manufacturers' Association, obtainable from makers of construction equipment tires.



ACCURATE CHECK of load carried by tires—basis of correct inflation—can be made right on job with weighing jacks. This service is available through the dealers.

# STRIP FOR *Traction*



## Restore Gripping Power to Worn-down Grousers **THIS** Way!

When tractor grousers become worn down more than an inch, the tractor wastes power. This means fewer pay loads per day, and increased wear on the track. The solution is quick and easy. Install Marquette Tractor Strip!

Tractor-Strip is made of special carbon manganese steel. The bottom is pre-formed for quick, efficient welding to the worn grouser edge. After welding, the grouser is as strong as the original.

Any welder with average ability can easily do the job. Use any high grade

all-purpose steel electrode, either A. C. or D. C.

Tractor-Strip comes in random length 10 to 14 foot bars, and 2 sizes to fit ANY caterpillar type tractor. Ask your jobber, or write today, for specification sheet which gives complete information about various tractor models, number and width of grousers, and footage of Tractor-Strip required.

Price 25½¢ per lb. 3¢ per lb. additional if cut to Grouser size.

**GET IT FROM YOUR JOBBER**

**MARQUETTE  
TRACTOR STRIP**

**MARQUETTE  
MANUFACTURING CO., INC.**

307 East Hennepin Avenue  
Minneapolis 14, Minnesota

*When you compare*

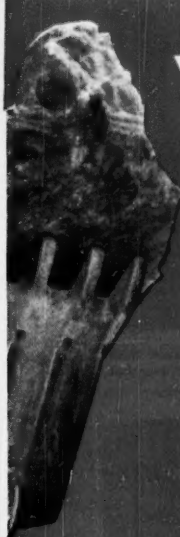


**KOEHRING**

**COMPANY**  
Milwaukee 16, Wis.

**Subsidiaries: JOHNSON • KWIK-MIX • PARSONS**

*... measure by*



# "KOEHRING WORK CAPACITY"

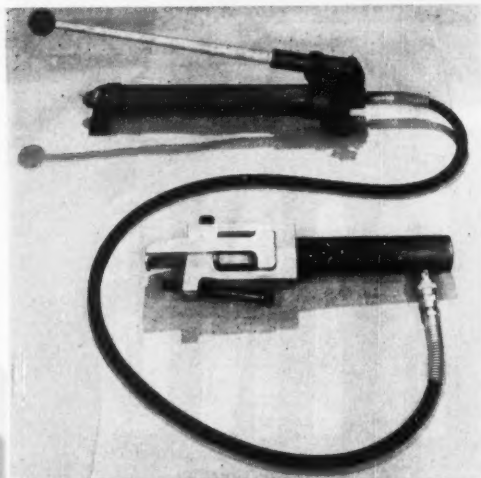
**Ask your Koehring  
Distributor for  
specific information**



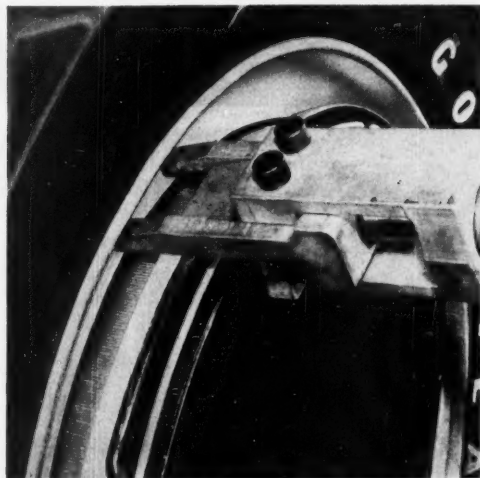
**7 $\frac{3}{4}$  to 79 $\frac{1}{2}$  TONS lift capacity . . .  $\frac{1}{4}$  to 2 $\frac{1}{4}$  yards dipper capacity**



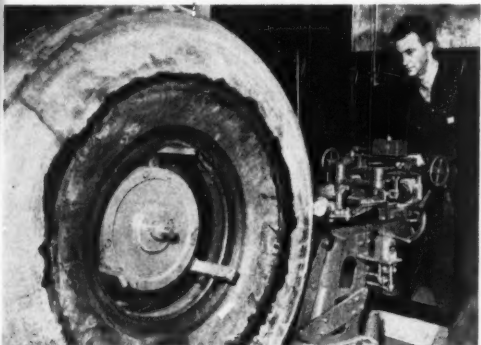
## Tire care cuts tire costs, and with construction machinery tires becoming larger and



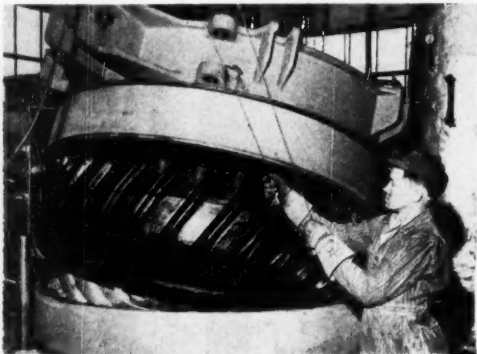
**SPECIAL TOOLS** are needed for mounting and dismounting big tires with modern tapered beads without risk of tire injury. At left is hydraulic persuader for freeing bead from rim, shown in



action at right, where rim side flange and tire bead have been forced inward so rim lock ring can be removed. Impact wrenches also speed tire-changing time and cut labor requirements.



**RETREADING SERVICE** is offered by many tire dealers and repair shops for rehabilitating tires with worn treads but with cord bodies



still sound. Here is a 21:00-24 Rock Type tire being retreaded at left, cured at right.



**JACKING UP** equipment between jobs to take weight off tires is best way to prolong tire life. If jacking is not feasible, keep tires well inflated to hold rounded-out shape.

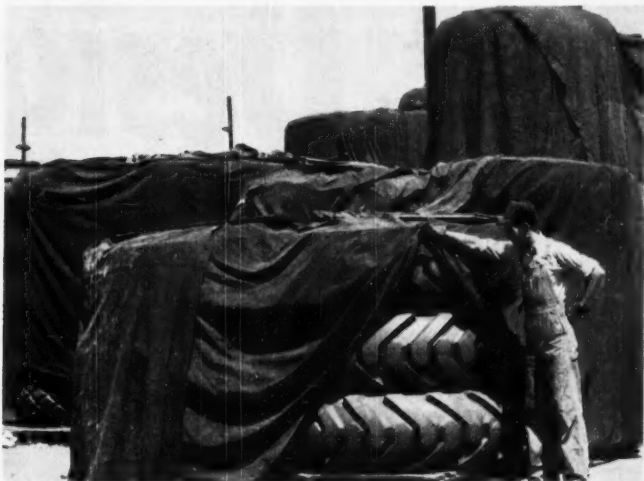
for the simple elements of good tire care have been broadcast by the tire industry in printed form for years. Contractors, by laying out in advance a pattern of tire service for each job, will find themselves better off than if they had simply regarded tire trouble and vehicle downtime due to tire failures as a necessary evil of their business. The first chance to exercise tire care comes when tires are purchased either as original equipment on the vehicles or for spares and replacements.

### Select Tires to Fit the Job

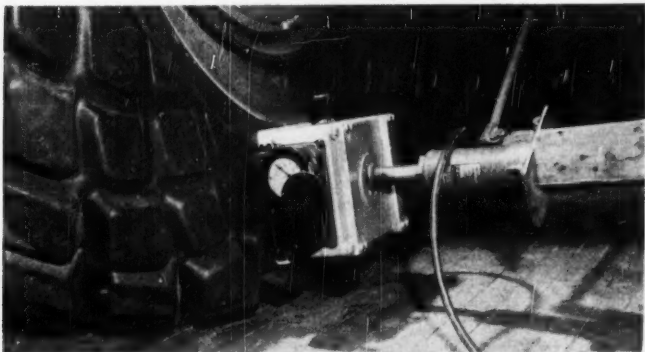
Equipment manufacturers select tires best for average conditions, but for most of the wheels



**more expensive, good tire maintenance is one good way to reduce operating costs.**



**KEEP TIRES** under cover for best service. Tarpaulin covers are good substitute for inside storage. Proper storage includes protection against too much sunlight, dampness, contact with steam pipes, oil and grease.



**PORTABLE VULCANIZERS** will repair cuts through tire treads or into outer layers of cord right on job without removing wheels.

in every fleet there are several optional tire sizes, ply ratings, and tread types. By exercising the right choice the buyer assures himself a fit of tires to the job which gives him a real start toward lower tire cost. Extra-large tires considerably improve flotation, and so will affect the drawbar power required and the speed with which the vehicle can get over soft ground.

Most tire sizes are made in more than one construction or ply rating to permit handling varying loads without change of tire size. Extra plies of cord and extra strength cord also allow for higher air pressures for heavier loads.

Different tread types meet var-

ious requirements of hauling conditions. Varying traction requirements and cutting hazards make necessary different tread designs—Rock Type, Traction Type, On and Off-the-Road Type, Earthmover Type, etc. Tire company specialists will be glad to explain these options in detail and to assist in tire selection for the contractor's equipment.

#### **Inflate Tires to Right Shape**

Next in importance are load and inflation. These are closely related, for combined they determine the shape of the tire in service. Maintaining the right shape is the object of recommendations of the tire in-

dustries listed in the standard tables.

You can easily determine loads right on the job with weighing jacks or portable load scales. Once the tire load is found, reference to the correct table will give the proper inflation. Maintaining the inflation without much variation requires regular checking at intervals, which will keep the minimum pressure within 10% of the recommended figure.

In construction work, tire recommendations call for relatively low pressures to allow the tires to roll with the punch over rough ground. Low pressures also improve traction and flotation through larger ground contact area. Pressures that are too high lead to extra cuts and bruises, great shock and depreciation to the vehicle and lost time due to getting stuck.

#### **Good Haul Roads Important**

Good haul roads and policing of loading and dumping areas will more than repay their cost in reduced tire failures and lower repair bills. Keep the haul road free from chuck holes for speedier operation and accident prevention. Loose rocks and spillage on the haul road are a constant cause of tire cutting. Patrolling to eliminate these hazards is also recommended.

#### **Check Drivers and Vehicles**

Vehicle operation is a factor in tire cost because of the way drivers handle the machines. Also the condition of the machines affects tire service in many ways. Speed should be avoided when cutting hazards are high, and drive wheels should not be allowed to spin.

Push dozer blades should be kept clear of tires. Machines should be checked frequently to make sure no bent parts or foreign objects picked up are rubbing and cutting into the tires. Bent rims do not properly support tire beads and should be taken out of service quickly and either straightened or discarded. When tires are changed rim rust should be removed before another tire is mounted.

#### **Prompt Repairing Pays**

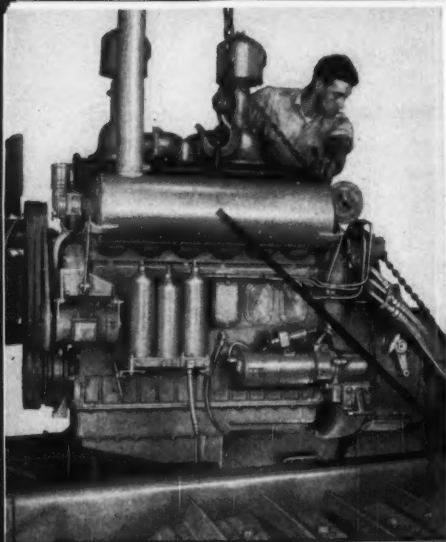
No matter how great the care taken to protect tires, injuries varying from small cuts to large blowouts are bound to happen. In many cases successful repairs can

*(Continued on page 74)*

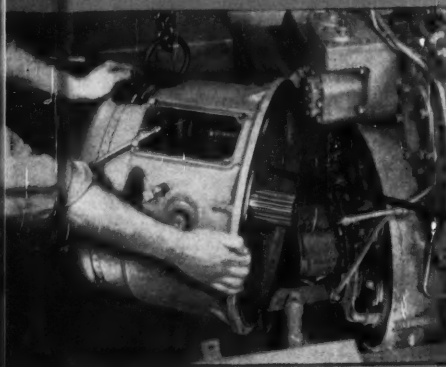
**Allis-  
Chalmers**

# Design

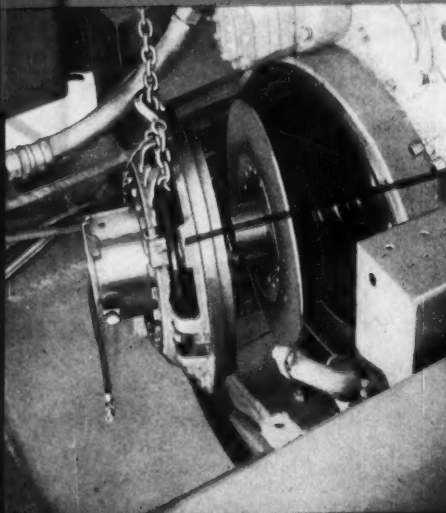
Another big reason why  
**HD-19**  
leads in tractor output



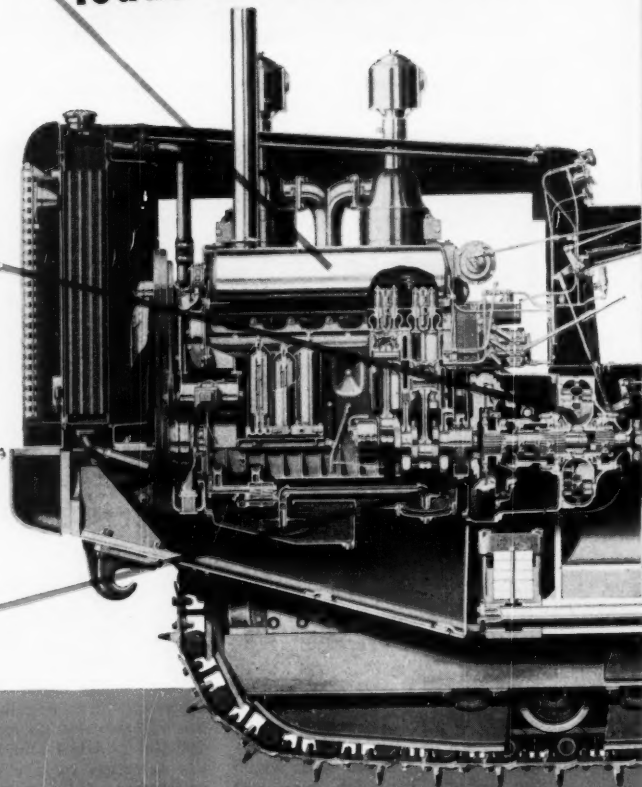
Engine can be removed without disassembling clutch.



Torque converter can be removed without disturbing engine or transmission.



Clutch assembly can be removed without disturbing either engine or transmission.



## More Reasons for HD-19 Top Performance

Torque Converter Drive

40,000 lb. of Balanced Weight

Exclusive Positive Seal 1000-Hour Lubrication

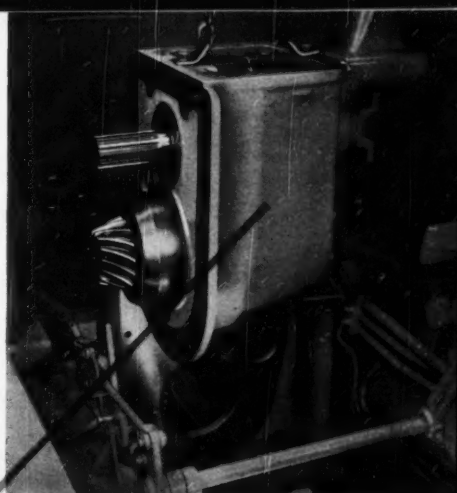
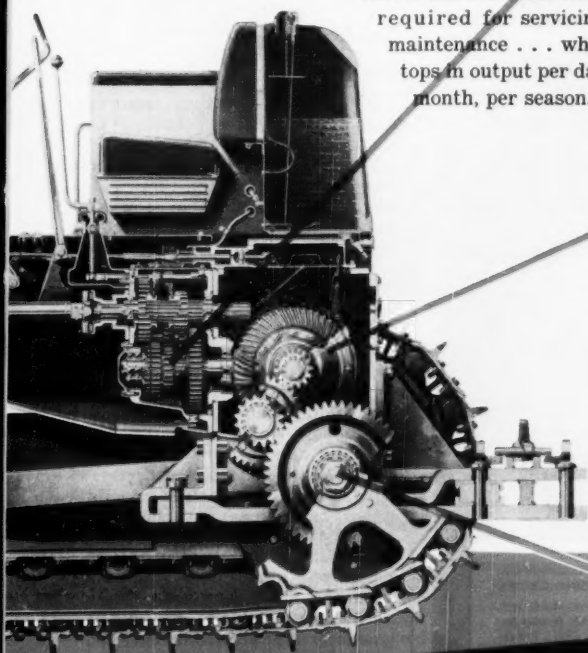
Greater Operator Comfort

# Simplicity

Gears, pinions and bearings by the dozen have been eliminated in the HD-19. This means fewer parts to wear — fewer breakdowns and fewer repair bills.

When maintenance is necessary, each assembly is readily accessible for attention. The HD-19 is designed so that each major unit may be easily removed and repaired or replaced *right on the job* without removing unrelated parts. The time and labor saved means substantial increases in the HD-19's over-all output. Remember, a tractor makes money for an owner only when it's working.

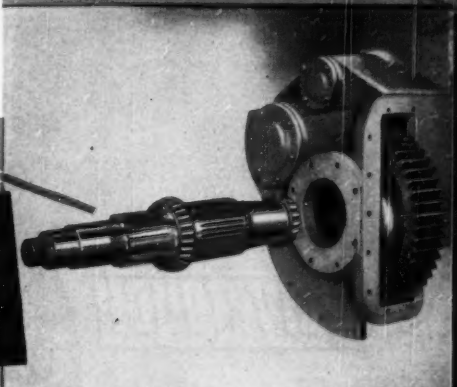
Simple unit assembly is another important reason why the HD-19 is low in total down time required for servicing and maintenance . . . why it is tops in output per day, per month, per season.



Transmission can be removed as a complete unit without removing clutch, final drive or bevel gear.



Each steering clutch can be removed independently without disturbing final drive or bevel gear.



Final drive gear and intermediate gear can be removed without disturbing steering clutch.

**ALLIS-CHALMERS**  
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

For Greater Production  
For Easier Operation . . . For Simplified Servicing



All-metal Velvetouch friction discs, made from powdered metal compressed and fused with a solid steel backing, stop the powerful Super C... not once but thousands of times... to deliver the extra hours of dependable, trouble-free braking service that cuts operating costs. That's why leading earthmoving equipment manufacturers, like LeTourneau, use all-metal Velvetouch clutch facings and brake linings as standard. They know that Velvetouch lasts longer... BECAUSE IT'S ALL-METAL. And for the same reason, you should insist upon genuine Velvetouch replacement parts. They cost less in the long run!

**THE S. K. WELLMAN CO • 1374 E. 51st STREET • CLEVELAND 3, OHIO**



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Canada, Ltd. 2839 Dufferin St.  
WASHINGTON, D. C., OFFICE  
1101 Vermont Ave., N. W.

## Equipment Tires

(Continued from page 71)

be made to extend tire life in service worth many times the repair cost.

To treat surface cuts it may only be necessary to skive away some of the rubber to prevent small stones from being held in the tread and forced down into the layers of cord. In other cases, cuts which extend into the outer layers of cord can be repaired without removing the tire from the vehicle by portable vulcanizing equipment.

If the tires are badly cut it may still be possible to prolong their life with built-in sectional repairs. Often, when treads are worn down but cord bodies are still sound, the tires can be retreaded.

Vulcanizing equipment to handle repairs and retreads of even the largest sizes is constantly being made available in more sections of the country. Thus, contractors can now get such service without excessive transportation costs and with reasonable promptness.

### Good Tools Necessary

Handling of big tires requires special equipment if damage to rims, tires, tubes is to be avoided. Special tools, including impact wrenches, will speed up tire changes and cut the labor requirements and the time the vehicles are tied up.

The final important factor of tire care is storage, which includes protection against too much sunlight, dampness, contact with steam pipes, oil or grease. When spares cannot be put into a building, they should be covered with tarpaulins or building paper. Then, before mounting, they should be checked to make sure that the insides are completely clean and dry.

Between jobs, vehicles should either be jacked up to take the weight off the tires, or the tires inflated at regular intervals to keep them well rounded out. The investment of the owner of large earthmoving vehicles in tires is generally large and money invested in proper storage and protection will be recovered in extra tire service.

Every fleet owner should put the responsibility in one individual and set up a real program for tire care. The cost of such a program would be returned many times over. Why don't you try it out and see for yourself?



# Now! Ford Trucks in biggest Economy Run ever made!



Watch for this sign!

Official Identification for  
thousands of truck users in the  
Ford Truck Economy Run

## To demonstrate Ford Truck Economy

...THROUGHOUT THE UNITED STATES...IN EVERY IMPORTANT TRUCK-USING VOCATION  
...IN YOUR KIND OF BUSINESS, WITH YOUR SIZE TRUCKS!

**The Ford Truck Economy Run,** most realistic economy study in truck history, is now under way throughout the United States.

**It's extensive!** Thousands of truck users from coast to coast are making the Ford Truck Economy Run over their regular routes. Every important kind of truck-using business is included.

**It's all-inclusive!** All Ford Truck models from 95-h.p. Pickups to 145-h.p. Big

Jobs will participate under actual day-to-day working conditions. Detailed records will be kept on operating costs for a period of six months.

**It demonstrates Ford Truck economy!** The Economy Run will demonstrate for everyone to see, what Ford owners have known right along. Ford Trucks do more per dollar in every kind of truck-using business. And this means they will do more per dollar for you in your business!

**Economy—one reason why Ford is America's No. 1 Truck Value!**

And Value is one big reason why more and more truck users all over the country are switching to Ford. Ford Trucks are making the truck industry's biggest sales gains.

Switch to Ford Trucks to feel the difference—in your pocket-book. See your nearest Ford Dealer today!

**In the long run, too—Ford Trucking costs less because**

## FORD TRUCKS LAST LONGER

*Using latest registration data on 6,592,000 trucks, life insurance experts prove Ford Trucks last longer!*



# ONE Grease for ALL



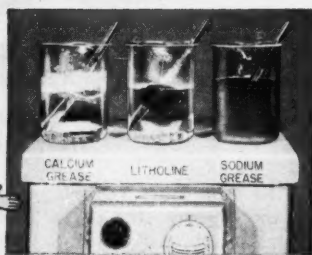
**"Yes—One Grease,  
One Gun and  
A Better Job too!"**

Here is a versatile grease that can be used with absolute confidence wherever lubrication is needed—chassis, wheel bearings, water pumps, universal joints, etc., in winter or summer—under all kinds of operating conditions.

*These 4 Severe tests prove  
**SINCLAIR LITHOLINE**  
is better than any single grease!*

**SCENE:** Sinclair's Research Laboratories, Harvey, Ill.

**CAST:** Two commonly-used greases of highest quality; a calcium soap chassis lubricant and a sodium soap wheel bearing grease; and Sinclair's Litholine.



## **WATER RESISTANCE TEST!**

Samples of each grease are heated in beakers of water. Near boiling, the sodium grease disintegrates into soapy water and oil. Shortly after boiling the calcium grease shows foamy emulsion as grease absorbs excess water. Litholine remains unaffected, proves its superiority in combating wet conditions.

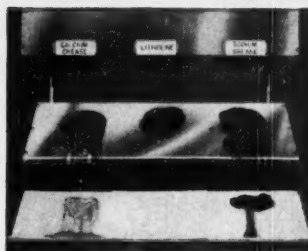
# SINCLAIR REFINING

# Lubrication Jobs!

## LOOK WHAT ONE-GREASE-ONE-GUN LUBRICATION MEANS TO YOU...

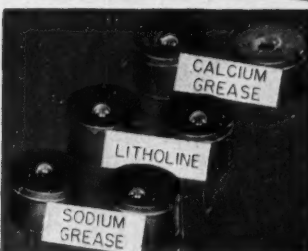


- 1 Superior protective lubrication
- 2 No danger of misapplication
- 3 Less chance for contamination
- 4 Reduced time-out for lubrication and maintenance
- 5 Fewer servicing man-hours
- 6 Less wastage
- 7 Fewer dispensing units
- 8 Smaller grease inventories
- 9 Simplified purchasing and distribution
- 10 A finer grease at every lubrication point



### HEAT-RESISTANCE TEST!

The samples are heated on a plate. At 190°F., the calcium grease disintegrates. At 340-350°F., the sodium soap structure collapses and releases the oil. Bearing failures would follow. At 380°F., Litholine shows no effects, proves superior for high temperature lubrication jobs.



### MECHANICAL STABILITY TEST!

Worked (kneaded) samples are placed beside samples of unworked grease. Steel balls are dropped. Distance ball sinks in worked samples shows increase in softness—loss of stability. The calcium grease showed greatest increase in penetration, the sodium grease next. Litholine showed no difference whatever . . . proving its superior mechanical stability in service.



### LOW TEMPERATURE PUMPABILITY TEST!

Lever-type grease guns are filled with chassis greases and cooled. At 20°F., it is impossible to pump the sodium grease. At 0°F., it is impossible to pump the calcium grease. But Litholine still pumps in good volume! Yet Litholine is a heavier (harder) grease. Thus, Litholine has the body for summer service yet is pumpable in severely low temperatures.

# COMPANY

For lubrication counsel, or more information on Litholine, see your nearest Supplier of Sinclair Products, or write to Sinclair Refining Company, 630 Fifth Avenue, New York 20, New York.

## ... Small Air Tools

BECAUSE OF ITS SMALL SIZE, the air tool is one of the most neglected pieces of equipment on a job. Good care and lubrication are just as important on portable air tools as on larger equipment. Money is lost when tools are not operating efficiently. To insure keeping air tools in good working condition at all times, set up a system whereby all tools are lubricated, inspected and repaired at regular intervals. Lubrication is most important of these three factors. Proper lubrication, together with a clean air supply, means increased life of tool with resulting decrease in repair costs.

The many varieties of air tools can be considered in groups to make easy their necessary care. These groups are listed below with suggested maintenance for keeping the tool on the job longer.

### Impact Wrenches

(A) Before starting a new wrench pour about a teaspoonful of clean, light body oil in the air

By A. G. RINGER

Pneumatic Tool General Sales  
Ingersoll-Rand Company, New York, N. Y.

inlet. Be sure the oil chamber in the housing is full.

(B) Daily clean out air strainer and fill oil chamber.

(C) Weekly, remove hammer case and liberally coat impact faces of both the hammer and anvil with grease as recommended by the manufacturer.

(D) Twice weekly, add light body grease to gear case and back-head through grease fittings.

(E) Once a month take wrench completely apart and clean out, replacing any parts that are worn.

(F) Before storing wrench for any length of time put one teaspoonful of rust-resisting oil in air inlet and run wrench for a few minutes so as to coat the motor parts.

### Concrete Vibrators

(A) Before starting vibrator pour about a teaspoonful of clean, light body oil in air inlet.

(B) Always use with an air line lubricator filled daily with light body, non-gumming oil.

(C) Weekly, disassemble vibrator and repack all bearings with a light grease. Also clean out the air strainer.

(D) After each shift, hang vibrator with point up and handle down to permit any condensation to drain out.

(E) Monthly, disassemble completely, clean out and replace any worn parts and repack bearings.

(F) Before storing for any length of time disassemble completely and remove any condensation, regrease and assemble.

### Sump Pumps

(A) Before starting make sure lubricator is full and give a couple of shots of grease to fittings. Light body, non-gumming oil should be used and a medium body water pump grease for the bearings.

(B) Refill built-in lubricator at least once a day and clean out air strainer.

(C) Grease pump through fittings weekly.

**Don't neglect your air tools—wrenches, drills, hoists, sump pumps, tampers, diggers, vibrators—**



IMPACT WRENCHES save (left) hours of tedious labor in bolted steel fabrication, but they need regular greasing, oiling, cleaning and inspection for efficient operation.



Concrete vibrators (right) work in abrasive, mechanism-damaging material, so cleaning and oiling are extremely important for these tools.

(D) Disassemble monthly and replace any worn parts.

(E) Before storing for any length of time put a teaspoonful of rust-resisting oil in inlet and run pump for a few minutes.

### Backfill Tampers and Diggers

(A) Before starting pour about a teaspoonful of light body, non-gumming oil into hose inlet.

(B) An air-line lubricator, filled daily, is advisable with this type tool.

(C) Weekly, the packing on the tamper should be checked and the backhead tightened, if necessary. On diggers, the handle bolts should be checked to make sure they are tight. Check the retainer parts at the same time.

(D) The shanks of the steel and the nozzle of the digger should be looked at every other week. The nozzle should be replaced if worn and, if the shank is defaced and cannot be redressed to correct length, a new steel should be used.

(E) Tools should be completely disassembled once a month, cleaned out and worn parts replaced.

### Drills, Grinders and Wire Brushes

(A) Before starting a new tool, fill built-in lubricator with a light body, non-gumming oil and put a teaspoonful of oil in air inlet.

(B) Refill built-in lubricator daily and clean out strainer.

(C) Weekly, add light body grease to grease fittings provided on tool.

(D) Once a month, disassemble tool completely, clean out and lubricate and replace any worn parts, if necessary.

(E) If storing tool for any length of time, pour a teaspoonful of rust-resisting oil in air inlet and run tool for a few minutes.

### Scaling, Chipping and Riveting Hammers

(A) Before starting, pour about a teaspoonful of light body, non-gumming oil into hose inlet.

(B) An air line lubricator should be used and filled daily. If this is not possible, put about three teaspoonfuls of oil in leader hose every 8 hr.

(C) Every other week, check shanks of chisels and rivet sets. If worn, they should be replaced. Also, the replaceable nozzle in the chippers and scalers should be checked and replaced, if necessary.

(D) Weekly, check handles and make sure they are tight.

(E) Monthly, disassemble, completely clean out, lubricate and replace any worn parts.

(F) Before storing, coat tool inside and out with a light, rust-resisting oil.

### Utility Hoists and Air Motors

(A) Before starting, make sure motor case is filled with a medium-body, non-gumming oil and that the gear case is filled with a medium gear grease.

(B) An air strainer, cleaned daily, should be used.

(C) Motor case should be checked every other week and any condensation drained off and oil level checked.

(D) Monthly, check grease level in gear case.

(E) Every six months, unit should be checked over and any worn parts replaced.

(F) Before storing, clean out motor, lubricate and put a tablespoonful of rust-resisting oil in air inlet and run motor for a few minutes.

These are only general instructions. You will find more detailed instructions in parts lists accompanying each new tool.

Just some common sense general care for air tools will pay off well in decreased downtime and long-lasting efficient operation. Air tools are labor savers, and as such it is important they be kept in good working condition.

just because they are small items, for it pays to keep these labor savers in top operating condition.



DRILLS AND REAMERS (left) such as this one at work fabricating a big penstock, can't run efficiently unless they are properly taken



care of. Diggers and tampers (right) speed up trench excavation and backfill, but they get rough service and need regular attention.

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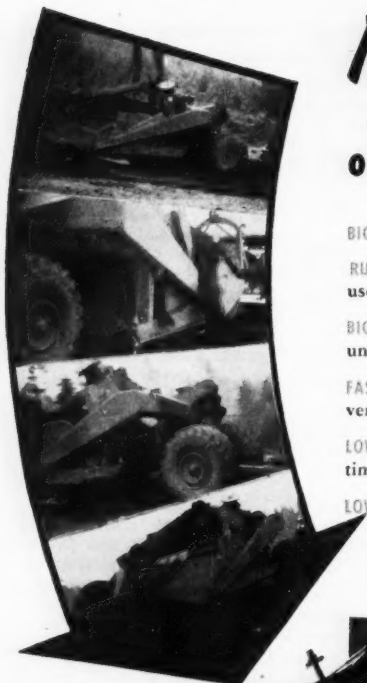
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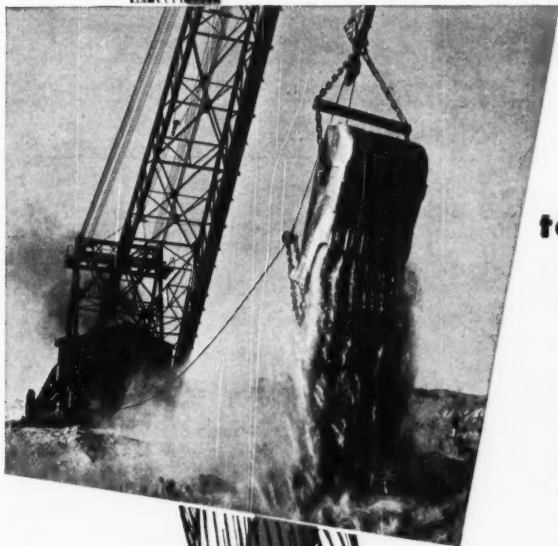
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## GOOD ADVICE FROM THE MANUFACTURER



THE PAVER is key unit in a paving plant that calls for investment up to \$150,000 or more. Good preventive maintenance here means

seconds saved per batch, which may mean difference between profit and loss on the job.

## ...Concrete Pavers

By A. E. MILLER Manager, Paver Dept.,  
Construction Machinery Div., Chain Belt Co., Milwaukee, Wis.

THE PAVER is the key machine of the contractor's paving plant. Its yardage production sets the pace for the outfit. The other units of the plant are so balanced as to insure maximum production from the paver.

A modern paving plant costs from \$100,000 to \$150,000. This cost is only for the paving plant alone, including the paver, aggregate bins, bulk cement bins, rough batchers, fine grader, forms, spreader, transfer finisher, longitudinal finisher, joint machine, water supply, road maintainer, and small tools. Batch trucks, shoulder and grading equipment represent additional heavy investment.

The labor cost for operating a paving plant today is very, very high. Maintaining a paver to avoid any breakdown or delays or even the loss of a few seconds each batch can mean the difference between profit and loss in paving operations.

Maintenance can be classed as follows:

- (1) Operating maintenance.

- (2) Daily maintenance after working hours.
- (3) Maintenance and inspection at idle times throughout the job.
- (4) Maintenance repair for next season's work.
- (5) Maintenance by proper storage.

### Operating Maintenance

A good, experienced operator is the best preventive maintenance for speed of operation and production. An inexperienced or careless operator can do untold damage by slamming clutches and brakes, dropping the skip and reckless handling of the boom and bucket. A good operator will observe small things during the day that can be taken care of after shutdown at night without stopping production. He can watch for worn cables, loose parts, etc. Preventive maintenance is of the utmost importance.

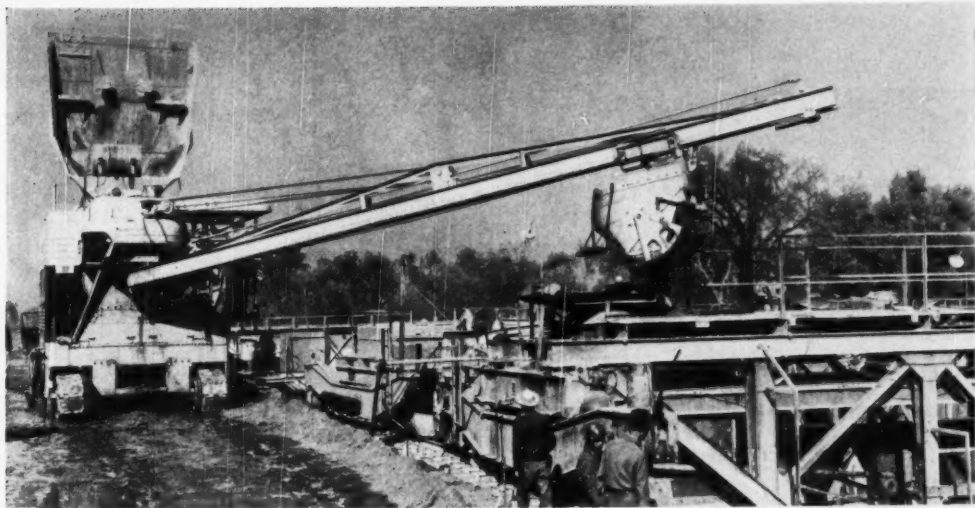
### Daily After Working Hours

Greasing and oiling with the

The paver is the heart of every paving outfit, setting the pace for production. Keeping the machine in top operating condition to save a few seconds each batch may spell profit for the job. Preventive maintenance pays well on paving plant.

correct lubricant specified by the manufacturer of the paver is No. 1 on daily maintenance. The man who does the greasing and oiling should be carefully instructed on every point that needs lubrication. The motor crankcase should be checked. Oil in the motor crankcase and all other enclosed cases should be changed as per manufacturer's recommendation.

Daily inspection should be made for loose nuts and bolts. Adjustments of clutches, brakes and other parts should be made at the end



PAVERS STEP OUT of highways to furnish concrete for other types of projects, such as for this canal lining job in California. Depend-

ability here is paramount, and good maintenance assures efficient, dependable operation.



THIS VERSATILE PAVER mixes concrete for a Memphis reservoir. Here, also, concrete production is key to job progress, and pre-

ventive maintenance on the paver prevents delays due to machine downtime.

of the day's run when possible. A good operator is invaluable in keeping watch of these details.

At the end of the day's run, cement and sand should be swept off the paver and washed down with a hose. Such surfaces as exposed to wet concrete should be sprayed with a suitable oil from time to time to prevent concrete from building up and forcing dirt into the bearings.

The inside of the drum should be inspected at night and any material lodged in it should be re-

moved before it sets up and makes removal difficult. Collection of concrete in a drum interferes with good mixing and speedy operation.

#### Maintenance and Inspection at Idle Times

There is time, due to rains, weekends and other causes, to take care of certain maintenance somewhat beyond usual daily routine. For example, if cables are showing splinters on the surface, they should be removed before they de-

lay production or do other damage. Worn clutches and brakes can be detected and taken care of, thus avoiding a shutdown. Maybe the engine needs a tune-up. A badly worn discharge chute or worn blades and buckets can waste valuable seconds, thus slowing up speed of operation.

As stated, these are just examples. There are other points of this same nature where preventive maintenance will pay large dividends by proper attention.

(Continued on page 87)



**WISCONSIN** — Both Heiliner Scrapers and Bottom-dump Wagons were used on this airport job. Scraper capacity 18 cu. yds. — Bottom-dump wagon 20 cu. yds.

**PENNSYLVANIA** — When the going's tough, like it is in the wet, slippery, sticky clay on this road job, you can count on Heiliners to give you faster haul cycles.

**ILLINOIS** — Keeping "Farm to Market" road costs down with a Heiliner. Note Heil Cable Dozer on tractor.



**KANSAS** — At Cedar Bluff Dam, dirt moved fast with Heiliners on the job — thanks to plenty of lugging power, high top speed, bonus loading, and passenger-car steering.





# 244 More Pay Yards with a Heiliner

*... proof that Heiliners move  
more dirt, faster--at less cost*

- That was the margin of superiority in an exacting competitive test. A contractor, with 2,000,000 yards of heavy, wet clay to move in a hurry, wanted earthmoving results. He arranged a test. The final figures showed that the Heiliner moved 244 more pay yards per shift than competitive units.

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**NEW JERSEY** — The Heiliner's efficient scraper design loads faster, eliminates voids for larger payloads, dumps cleanly and more rapidly at the fill for more round trips.



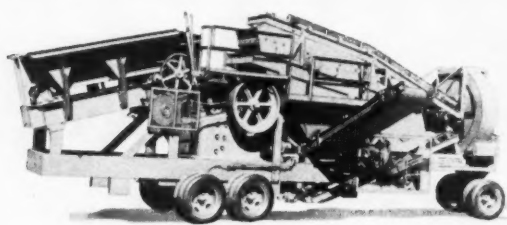
**FLORIDA** — Plenty of flotation for fast travelling in this sandy soil. Cable life is longer because cables and sheaves are located outside the bowl away from abrasive material.



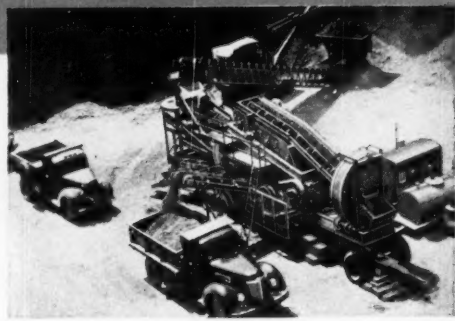


# 4

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**3** TwinDual Master Gravel Plant—double the output of conventional two-stage plants of comparable size and weight

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for 3 full stages of reduction?**

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## Concrete Pavers

(Continued from page 83)

### Maintenance Repair for Next Season

A thorough inspection should be made of all working parts and closed cases should be taken apart to determine the amount of wear and whether parts should be replaced or only adjustments made. Such parts that are worn, but still have some life, should be replaced so there will be no question about lasting a full season. It is least expensive to do it this way.

After inspection is made, a list should be made up of everything needed and ordered at one time. This procedure will save costly express or other transportation charges. When all the material is on hand, then the overhauling can be done in a shorter time with lower expense.

The paver should be cleaned sufficiently for a repaint job and repainted. A paver properly overhauled and put in good working condition before the season starts will pay dividends on this expense.

### Maintenance by Proper Storage

After the paver is overhauled, cleaned and painted, caution should be taken to prevent deterioration in storage.

The engine should be filled with an oil that preserves cylinder walls and working parts subject to deterioration from internal dampness.

Slushing oils should be applied to working parts that are exposed and not submerged in oil-tight cases.

Of course indoor storage under a dry roof is the proper storage for a paver and other expensive machinery. But this may not always be possible. If shed room is not available, extra precaution should be taken to insure the best protection by a good paint job and protection of working parts with the necessary oils and products now on the market for that purpose.

### Manufacturers' Manuals Valuable Help

Every paver manufacturer, in line with makers of all heavy construction equipment, issues parts books, and operating and instruc-

(Continued on page 88)

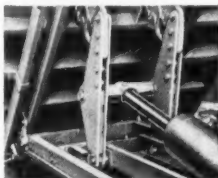


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**GALION** *Fulcrumatic*  
**HOISTS DUMP MATERIALS  
FASTER . . . SMOOTHER!**



**FULCRUMATIC LEVERAGE** smoothly transmits the power of pump and cylinder to the load . . . automatically shifts to the most efficient leverage through the entire unloading cycle.



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(Continued from page 87)

tion manuals that are valuable aids to preventive maintenance. Chain Belt, for example, puts out operator's manuals for all Rex pavers. These are divided into seven sections: Controls, unloading and erection, reshipping, preparation for operation, operating instructions, trouble shooting, and adjustment and maintenance.

A study of manufacturers' manuals will acquaint operators, mechanics and supervisory personnel with the various parts and functions of the machine, will aid in keeping the unit in top shape, and will help in spotting and correcting troubles. These booklets are the key to preventive maintenance.

### When Should Replacement Be Made?

The boss should remember that when he spends money for maintenance he's making an investment for longer paver life and insurance against delays and breakdowns. Maintenance investment means more profit, not expense.

It is a well-known fact that some pavers are badly worn and subject to breakdown and delay and slower operation at the end of a couple of seasons, where other machines are giving high speed production after many years of service. The difference is just in operation, care and maintenance.

### Maintenance Goes Just So Far

There is a point where repair and maintenance should cease and the paver should be replaced with a new one. Maintenance is a good thing but it can be carried too far.

Pavers, like other equipment, have been modernized and have undergone constant improvement for higher production, and easier and faster operation, resulting in lower yardage cost. Modern methods of engineering and construction require less maintenance, hence lower operating cost.

Maintenance cost, coupled with lower yardage production of an older model, can become so high that the investment in a new modern higher production paver will pay dividends.

Experience and good judgment, considering the yardage to be placed, are the deciding factors to determine when it is no longer profitable to maintain an old paver and replace it with a new one.

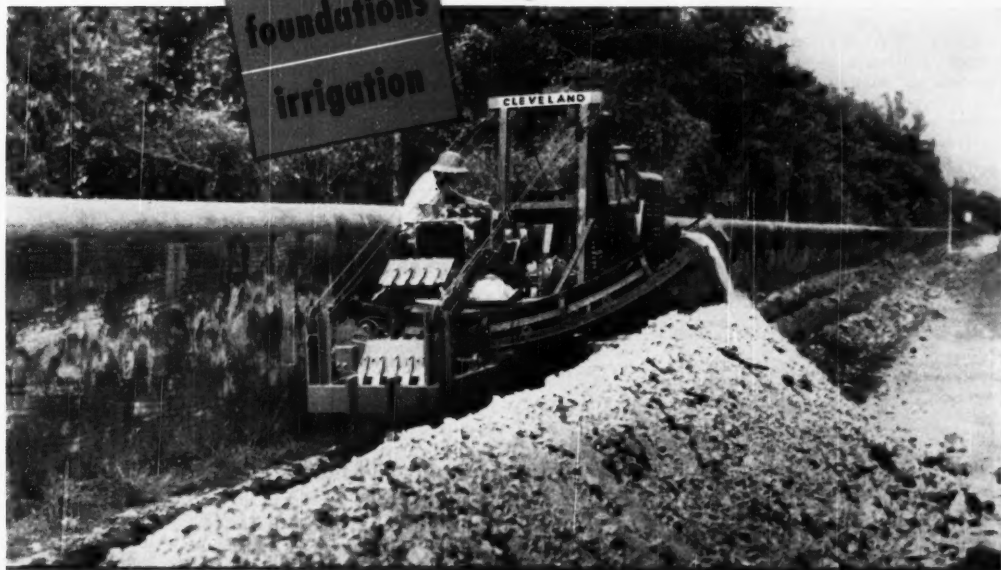
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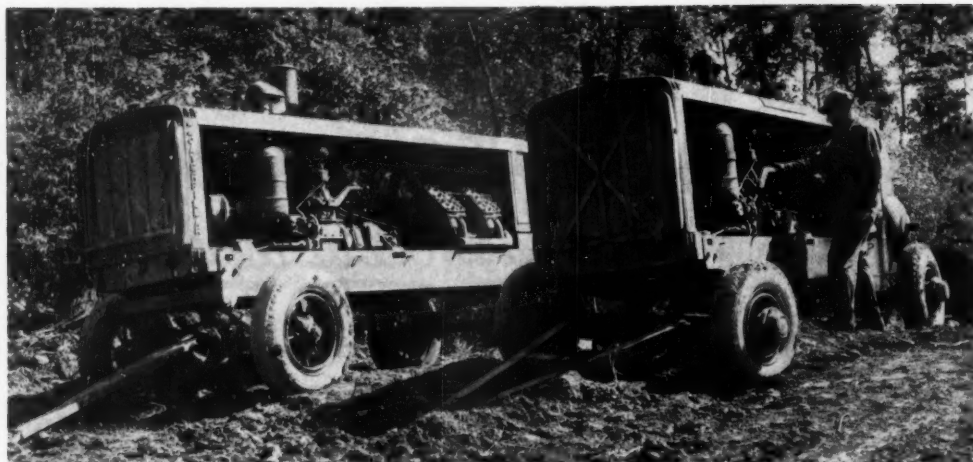
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## CLEVELAND TRENCHERS



## GOOD ADVICE FROM THE MANUFACTURER



COMPRESSORS are about tops in construction equipment for long life and dependable service. They respond well to attention and maintenance, however, and shouldn't be neglected just because they are so dependable.

### ... Air Compressors

By J. E. O'Rourke, Chief Engineer, Contractors Division  
Chicago Pneumatic Tool Co., New York, N. Y.

THROUGHOUT THE YEARS manufacturers of air compressors have constantly improved their product until today the compressor is one of the most dependable and efficient machines in all construction. Given reasonable attention and maintenance, compressors will respond with a long life of trouble-free service. Yet, because they

seldom do give trouble, these machines are often neglected—especially the portable types—and neglect means eventual downtime and extensive repairs.

Maintenance of the air compressor consists of a few simple considerations. These, if followed with regularity and thoroughness, will result in a long and satisfactory

machine life. Assembly must be correct. Parts must be correct and undamaged. Lubrication must be adequate. Adjustment must be suitable. Extraneous matter and dirt must be guarded against for what they really are—the machine's worst enemy.

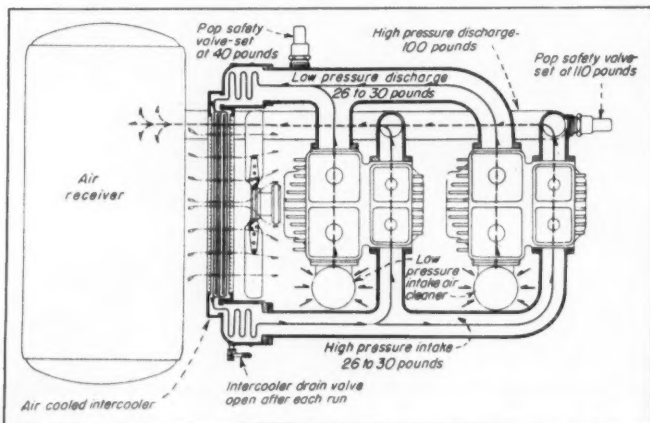
#### Watch the Valves

Valves are the heart of the compressor. Care and maintenance of these vital parts will do more than anything else to keep the compressor operating smoothly, efficiently and give it long life.

Emergency shutdowns due to valve trouble can be prevented by rotating valve maintenance. At least one complete valve of each size used in compressor, and component valve parts should be kept on hand as spares.

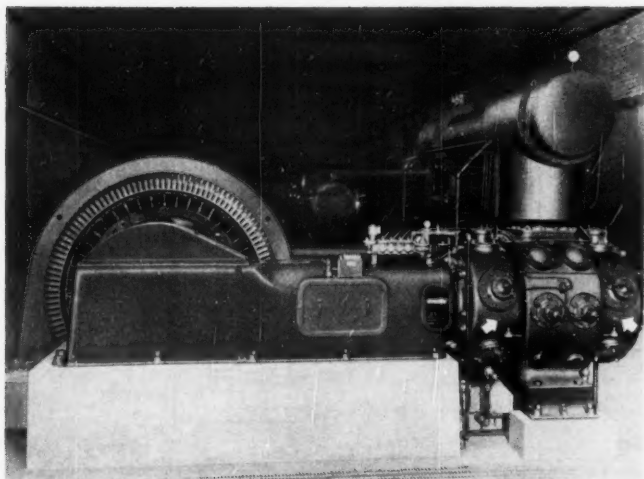
Most compressor units can be shut down for a short period each day to permit changing one valve without interfering with production. By having a new or repaired valve ready to exchange with valve removed, this work would not require more than 15 to 20 min on most compressors.

The valve which is removed can be cleaned and repaired and held ready to install the next day. This cycle of exchanging and repairing one valve at a time each day, until all valves have been checked, should be repeated every few months, or as often as operating conditions warrant. The advantages in this method of repairing



AIR FLOW diagram for a two-stage portable compressor. These machines are relatively simple, yet are deserving of proper maintenance and care.





**BIG TWO-STAGE** stationary compressors are popular on tunnel and pneumatic caisson work. These machines are fully automatic, but most important maintenance is on intake and discharge valves and pistons. Arrows point to indicator connections that are used for finding leaky valves.

valves over periodic shutdowns for repairing all valves are, besides preventing emergency shutdowns, improved repairs, better efficiency and fewer repair parts.

Where units are taken out of service for a few hours, after several months operation, and all valves removed, repairs are usually hurried and, consequently, not thoroughly done. By rotating valve repairs, machine is only out of service a few minutes, and several hours can be used to clean thoroughly one valve, re-machine valve seat if necessary, and re-

place damaged parts. Frequent checking will reduce cost of repair parts and maintain maximum efficiency, as valves will be kept clean and generally only minor items such as springs will need replacing, while if valves are permitted to operate for long periods without repairs, the failure of minor parts will result in damage to other parts of valves and machine.

### Spotting Valve Trouble

Valve trouble in two-stage com-

pressors can usually be detected by observing intercooler pressure. Intercooler pressure varies with the size of cylinders and intake pressure, but generally is between 26 to 30 lb on a machine discharging at 100 lb with atmospheric intake. The correct intercooler pressure can be figured approximately by substituting values in the following formula:

$$P_2 = P_1 \times \left[ \left( \frac{D_1}{D_2} \right)^2 - 1 \right]$$

$P_2$  = Intercooler gage pressure, psi

$P_1$  = Absolute intake pressure, psi

$D_1$  = Dia low pressure cylinder, in.

$D_2$  = Dia high pressure cylinder, in.

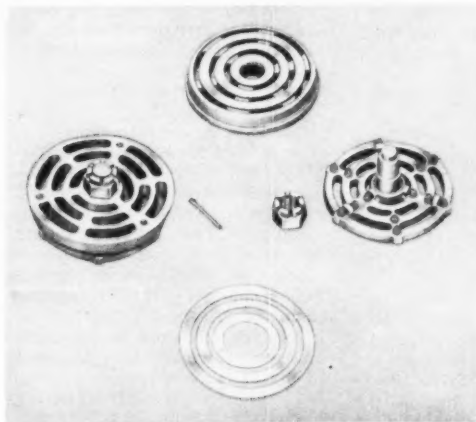
For example, substituting for 26 in. low pressure cylinder and 15 in. high pressure cylinder operating at sea level:—

$$P_2 = 14.7 \times \left[ \left( \frac{26}{15} \right)^2 - 1 \right]$$

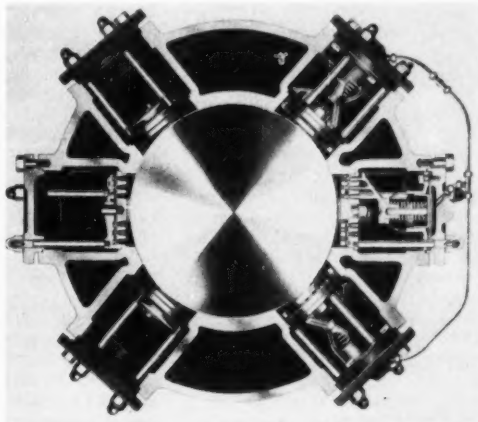
$$P_2 = 29.4$$

High intercooler pressure indicates trouble in the high pressure cylinder. This could be caused by leaky or damaged intake or discharge valves, or leakage from piston rings due to condition of rings or cylinder bore.

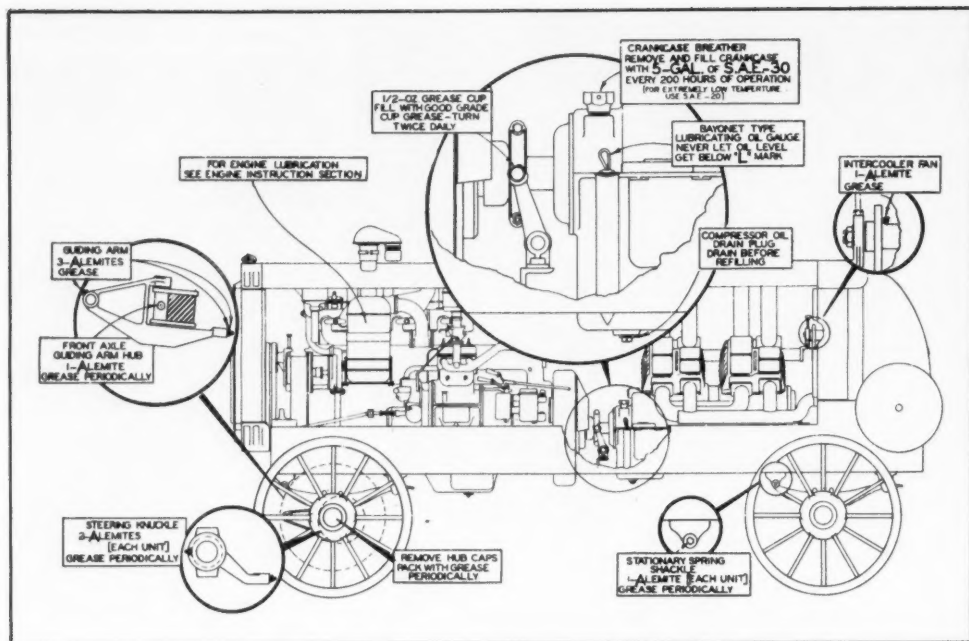
Most air cylinders or heads have openings, for connecting an indicator, which lead directly to cylinder bore at each end of cylinder. By removing plugs from these openings, leakage through discharge



**VALVES** are the heart of the compressor. Here are assembled (extreme left) and exploded views of CP Simplate Valve. Rings (bottom) are held against seats (top center) by springs (right) and air. Carbon and dirt build up at valve seat causing leaks.



**VALVE ARRANGEMENT** is shown by cross-section of compressor cylinder. Inlet valves are at right, discharge valves and unloaders are at left. Rotating valve maintenance finds leaky ones before breakdown ties up compressor.



LUBRICATION DIAGRAM for portable compressor indicates vital points that need regular attention. Compressors are most susceptible to lack of lubrication.

valves can be readily checked. For high pressure cylinder, this check should be made when machine is shut down with no pressure in intercooler, intake valves in loaded position, and pressure in discharge line. There will be slight leakage with most any type compressor valve, but if there is a continuous blow, it indicates excessive leakage, and valves should be removed for inspection. If leakage is only in one end of cylinder, this check will show end involved, and it will only be necessary to inspect discharge valves from one end to locate trouble.

In checking for trouble in inlet valves, this can be done while machine is in operation. If inlet valves in one end of high pressure cylinder are leaking, or are inoperative, the end involved can be determined by observing intercooler pressure at different loads. If intercooler pressure returns to normal, say at half load, then it would indicate that the trouble is in the valves which are unloaded. A leaky inlet valve can be found by comparing temperature of inlet valve covers. The cover of a leaky inlet valve will be warmer than other covers if machine has been operating loaded for some time. This check is of no value if

inlet valves have been unloaded for long enough period for all inlet covers to become warm. If no trouble is found in valves, then condition of piston, rings, and cylinder should be checked.

If intercooler pressure is below normal, the trouble is in the low pressure cylinder and can be located by following same procedure used in checking high pressure cylinder, except that when shutting unit down, intercooler pressure will have to be held until leakage through low pressure discharge valves is checked.

When checking valves, seats for valves in cylinder or head should also be inspected. Damaged seats are usually caused by not having valves securely held on seat by valve covers, and pounding of valve during operation soon damages seat to such an extent that satisfactory repairs can only be made by re-machining seat or refacing with hand reseating tool, which can usually be borrowed from compressor manufacturer. When seats are badly damaged and considerable metal has to be removed to reface seat, it is usually necessary to install ring or false valve seat between valve and seat to prevent valve from extending past cylinder bore line.

In case of inlet valve trouble, unloading valve covers should be inspected, as well as valves, for difficulty could be caused by valve unloading mechanism being inoperative and preventing normal operation of valve.

### Stationary Compressors

In general, maintenance procedure is the same for all types and sizes of compressors, but there are a few precautions that should be especially considered in relation to the two main types, stationary and portable. Here are a few suggestions that apply particularly to the big stationary units such as used for tunnel projects.

**Location** — Preventive maintenance of stationary compressors starts with proper location and installation. The compressor should be located in a clean, well-lighted place with ample room allowed around the unit so it can be readily cleaned and inspected. Don't crowd a machine too close to the walls or to other units, for you need plenty of space to remove pistons, rods, intercoolers and other big parts.

A solid foundation is an absolute must requirement. The manufacturer (Continued on page 96)

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Operators will find that the exceptionally fine arc action of Airco No. 388 increases both the speed and quality of their work.

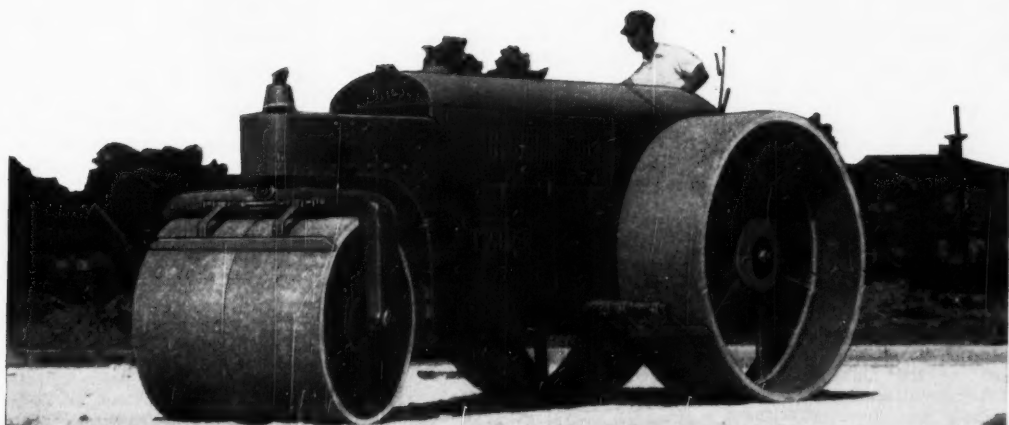
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EXTREME EARTH ABRASION  
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(Continued from page 92)

turer will gladly furnish foundation plans for each machine, but it is up to the buyer to see that the compressor is installed on a proper concrete foundation, with the machine set absolutely level and grouted into place.

**Piping**—No compressor operates to full efficiency unless the piping, including aftercooler and receiver, is right. Intakes should be in a shady spot, dust free as possible. Every increase in intake air temperature decreases the operating efficiency. Don't cramp your compressor output by using too small pipe, valves and connections—pay attention here to the manufacturer's recommendations.

Keep the aftercooler and receiver as close to the compressor as possible. Water traps and drains must be properly hooked up, and in cold weather they must be protected against freezing. An ample supply of cooling water is necessary, and it must be free-flowing through the cooling units. Water jackets are usually designed for a maximum pressure of 45 psi.

Safety valves must be installed in air discharge lines between compressor stages and on the high side of the high-pressure unit. Never install a valve between compressor and receiver without a safety valve between valve and compressor. Irreparable damage may result from pressure built up to the bursting point of any part, piping or tank.

### Watch the Starting

**Starting**—Care in starting a new machine or one that has been idle for a long time is good preventive maintenance. See that the inside of the frame, oil reservoir and connecting rod bearings are clean. Remove the frame crank shield, crosshead door and rear cover on each frame and wipe the inside out thoroughly with non-linting rags. Blow out the piping that carries the flow of oil to the crosshead. See that the inside of the crankcase is absolutely clean—you can't give this detail too much attention.

Bar the machine over for several revolutions to see that everything is all right before turning on the power. New machines should run without load for several hours to test the bearings, then the load can be increased gradually to test the valves and piping.

**Lubrication**—The life of a com-

pressor depends almost entirely upon the effectiveness of lubrication. Therefore, selection of proper lubricants should be given considerable thought. Experience has shown it never pays to use cheap oils and greases.

Any good grade of machining oil with a viscosity of 200 to 425 sec at 100 deg F should be used in the crankcase. Crankcase oil serves as a coolant as well as a lubricant. Lighter and heavier oils should be used in cold and hot weather, respectively, if the compressor is exposed.

Examine the oil in a new compressor after the first 8 hr of operation, for it may be contaminated with dust and dirt. Thereafter, the main reservoir should be drained at least once a month.

The best air cylinder oil available is recommended for the cylinders and it pays to get the advice of oil company specialists, who will gladly base their recommendations upon the operating conditions encountered.

Oil levels and capacities for each point of application are plainly marked on the machines. It pays well to see that adequate and proper oils are used at all times. Lack of oil can ruin an expensive compressor in a hurry.

### Portable Compressors

Portable compressors on construction take a beating. They are usually moved frequently, are located more often for convenience than for best operating conditions, and are all too frequently subject to neglect. Here are a few general precautions and safety measures:

- (1) Set machine level.
- (2) Maintain oil levels between gate works.
- (3) Stop machine if oil gages fail to show pressure.
- (4) Lubricate fans and clutch throw-out bearings individually.
- (5) Be sure engine cooling system is working.
- (6) Drain receiver and intercooler after each run.
- (7) Protect against freezing of cooling water.
- (8) Always keep machine clean.
- (9) Handle fuels with extreme care.
- (10) Never permit gasoline or kerosene fumes to be compressed—*you* may cause a serious explosion.

(11) Never blow compressed air on a person.

(12) Don't put hands into moving machinery.

**Starting and Stopping**—Make sure the compressor is properly lubricated (also the engine), that the clutch is thrown out, and that drain valves on receiver and high-pressure inlet manifolds, and service discharge valves are open. Allow engine to warm up before engaging clutch to start compressor. Close drain valves and then close discharged valves to build pressure up gradually. Check gages for pressure. New machines should be operated at half normal pressure for first hour.

In stopping machine, open drain valves before disengaging clutch. Allow engine to idle for 5 min before shutting off. Leave clutch engaged to relieve spring tension and to keep dirt out of clutch mechanism.

**Air Filters**—Use solvent, dry cleaning, to wash out filters. Never wash filters in gasoline, for you may create an explosive mixture in compressor cylinders or receiver.

**Fan Belts**—Fan belts should be tight enough to prevent slipping, but not excessively tight. V-belts should be slightly slack on non-driving side when running.

**Lubrication**—See accompanying lubrication chart.

**Valves**—Follow general instructions given above.

**Air Cylinders, Pistons and Rings**—These must be maintained in good condition to avoid excessive use of oil and leakage of air past the pistons, which would greatly reduce operating efficiency. Air cylinder bores should be highly polished and free from score marks or roughness. After years of hard service, cylinders may be worn out of shape. Regrinding or honing in line with automotive practice are satisfactory for reconditioning cylinders.

**Other Parts**—Clutches, pressure transformers, unloaders, controls and gages are precision items, and should not be monkeyed with by inexperienced personnel. Manufacturers compile detailed manuals and instructions covering these items, which should be followed to the letter for proper maintenance and trouble-free operation.

Give the compressor a little attention and care, and it will respond with many hours of efficient production.



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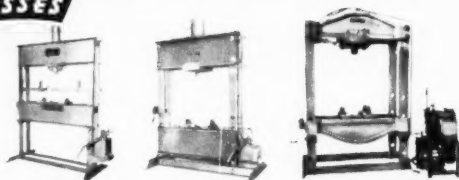
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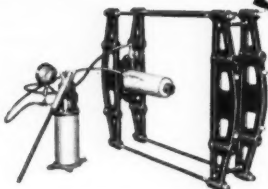


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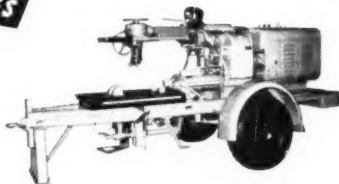


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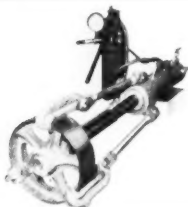


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Portable or stationary Forcing Presses for 1001 pressing, bending, forcing and straightening operations. Hydraulic power supplied with hand pumps or power-driven pumps. Easy to assemble and operate at the job.



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ROADSIDE SERVICE STOP, such as this, is one mighty important step in preventive maintenance. Here a LaPlant-Choate scraper unit gets a quick checkover that includes cleaning bugs out of radiator, greasing, oiling and tire and battery inspection.

### ...Motor Scrapers

**Any machine will break down, but when equipment is properly maintained, the mechanics will spend most of their time making preventive adjustments rather than making major repairs and installing new parts.**

BY A. W. SCHMIDT

LaPlant-Choate Co., Cedar Rapids, Iowa

NO MATTER HOW WELL a machine may be designed and built, the manufacturers of earthmoving equipment haven't yet turned out a product that, in the absence of a well-regulated program of preventive maintenance, will give anywhere near the operating satisfaction expected by the owner. Preventive maintenance is a very simple and necessary function: regular and periodic performance of maintenance procedures essential to obtain satisfactory day-to-day operation. At considerable expense and trouble, the manufacturer compiles preventive maintenance charts and schedules for the machine he builds, but they are no value if not used. The owner should see to it that his employees follow the lubrication and maintenance recommendations to the letter. Those who choose to ignore such recommendations, or who sanction the departure therefrom, must be content to accept the re-

sulting penalty—increased downtime, higher maintenance expense, and in the end, increased operating and production costs.

In figuring job estimates contractors with a poor preventive maintenance program penalize themselves unnecessarily because they are unable to count on more than 35 to 40 min production from each machine each hour. The installation and strict adherence to a satisfactory program of preventive maintenance would, in many cases, boost production to where the necessity of additional machines would be eliminated, by placing their present equipment in operation a greater percent of the time.

Experience proves that the time invested in preventive maintenance is but a small fraction of the cost of maintaining a unit and keeping it productive as compared with that of repairs and downtime without maintenance.

Absolute freedom from repairs is impossible. All equipment will wear out eventually. However, a well-regulated program of preventive maintenance, properly executed, will go far in reducing unwarranted repair and high cost of operation.

Most contractors are not so much concerned with cost of labor and parts as they are with production loss when a unit is down. Roughly the ratio of production loss, parts and labor is: production loss, one-half; parts one-third; and labor one-sixth. So many factors are involved that a hard-and-fast rule is not practical. Yet you can see that for a machine out of operation due to neglect, and requiring no new parts but only an adjustment to put it back into production, the ratio changes so labor cost is but a small item compared with that lost by non-production. On a job properly maintained, maintenance personnel will spend the greater part of their time actually making preventive adjustment, rather than installing new parts after the unit has broken down.

#### **Lubrication Important, But Not All**

Lubrication is often the only preventive maintenance the unit receives. True, lubrication is important, but alone it can't take care of a machine. A part that is well lubricated will outlast one that gets no grease. Yet adjustments are necessary even for parts



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The Vulcan Pile Extractor is simple in construction, durable and efficient. With only one moving part, it requires no assembly to put it in service, no adjustments, and it can't get out of order.

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that run in oil; hence attention not given when due will result in a costly breakdown or expensive repair.

Bearings fail because of neglect. If kept properly adjusted, clean and well lubricated they are capable of many more hours of use than is generally received.

Gears fail for many reasons. Backlash should be held strictly to the manufacturer's specifications. Lubricants should be used according to factory recommendations.

Clutch life is shortened by improper adjustment or the lack of it. When an operator allows a clutch to slip, its usefulness is practically over. Adjustments should be made while there is still a margin of safety.

The cooling system of a unit can be either the most trouble-free or the point of most concern. Many a cracked block and cylinder head result from running with the coolant low. Equipment operating up and down hills with the coolant low causes alternate drying and flooding of the heads, either of which will result in extreme damage to an engine.

Air cleaners should be cleaned and serviced according to the operating conditions, sometimes as often as every 4 or 5 hr. The air cleaner on the modern earthmoving machine can operate as much as 98% efficient if kept clean. A dirty air cleaner can ruin an engine in a few days.

### Check Tires Daily

Tires on earthmoving machinery should be checked daily. Foreign material such as rocks, glass, etc., should be removed from the treads immediately. Cuts should be repaired at once. A small cut if taken care of promptly will cost little, but if allowed to grow can send the tire to the scrap heap in short order. Inflate tires in the cool of the day, and under no circumstances bleed them during operation to compensate for built-up air pressure.

From 85 to 90% of electrical failures can be traced to neglect. Loose connections, low batteries, and faulty wiring can lead to generator failure, or voltage regulator failure, either of which may cause the other to put the machine out of production. The electrical system will give nearly perfect trouble-free service if the proper attention is given at regular intervals.

Brakes are necessary to prevent accidents and aid production. Brakes should be kept in top working order at all times if the unit is to give peak performance.

Cable will last many times longer than you think, if properly taken care of. Use the correct size according to the factory recommendations for the unit. Very little can be gained by using larger cable than recommended. Sheaves are not generally ground to handle other than one size cable. Do not allow wire rope to become frayed or flattened. Change position of the cable on the sheaves by unreeling cable from the spool.

### Recommended Program

A good preventive maintenance program should include:

(1) A supervisor or master mechanic to plan and assign work, thus keeping the men pushing the maintenance, rather than the maintenance pushing the men.

(2) Adequate and properly trained personnel equipped to handle all service and repairs.

(3) Proper tools, equipment, manuals and charts.

(4) Adequate records of service for all units and insist that the manufacturer's recommendations are followed at periods specified.

(5) An education program in cooperation with the manufacturer to keep up with new developments.

(6) Operator education: to include a thorough knowledge in the operation of his unit, its limitations, maximum production without damage, checks during operation, and a method of reporting minor trouble before they become major breakdowns.

(7) A set schedule and procedure to follow for all preventive maintenance, including a check sheet with a minimum of writing.

(8) Well-maintained operating conditions so that equipment will not be subjected to unnecessary abuse while in operation.

Remember, the modern earthmoving machine is a finely designed and engineered piece of equipment. Under most operating conditions it will stand most anything except continuous abuse or neglect. If you give these machines proper attention through a well-regulated program of preventive maintenance, you'll be amazed at the hours of profitable trouble-free operation they will produce.

**"there's a great  
piece of  
machinery-**

**FOR DIGGING IN  
ROCK OR EARTH"**



**LINK-BELT  
SPEEDER**



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ARE GREAT  
L-B-S FANS**

There's not much room in the contracting business for sentimentality, but in my travels around the country I find that Link-Belt Speeder owners have the same affection for their Link-Belt Speeder Shovel-Cranes that old time contractors felt for their hard working horses . . . and for the same reasons . . . Owners respect and admire faithful and dependable performance.

## **IT'S THE LINK-BELT SPEEDER LS-85**

**— The Super  $\frac{3}{4}$  Yd. Shovel-Crane**

When Otto Ashbach & Sons of St. Paul shipped their LS-85 to Decorah, Iowa to excavate 10,000 yards of rock, they knew that this shovel would do the job right, and at a profit . . .

Because they had learned years ago that Link-Belt Speeders are dependable and hard working—and have the speed to set good performance records.

After operating Link-Belt Speeders for 11 years, Ashbach superintendent, Clifford Cleveland, said to me: "I think Link-Belt Speeders will out perform any other machine."

I had heard those words many times before from owners, superintendents and operators, and once again I had a good report for the folks back home.

# **LINK-BELT SPEEDER**



11-045

# CAMPBELL'S CORNER *A Monthly Equipment Maintenance Feature*

By HOMER C. CAMPBELL, Service Manager, H. W. Moore Equipment Co., Denver, Colo.

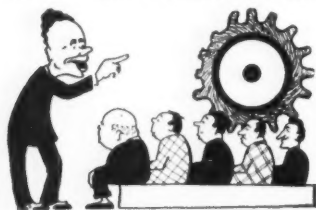
## Planned Maintenance...Key to Profits



FOR A GUY who spends most of his time with his feet on a desk and the rest of it pushing a bunch of nut-busters in a shop, to attempt to tell an assortment of active construction people how to handle their equipment is a good deal like having an old maid tell you how to raise children. But it may be that a service manager is like an old maid, always looking for something that isn't to be had—a perfect maintenance program.

Systematized preventive maintenance in its present form is comparatively new. True, maintenance has existed in one form or another for a considerable time. But unplanned, and not properly appreciated by the powers-that-be, it has been more or less ineffectual. The systematic performance of periodic inspection and maintenance will prevent the breakdown of equipment, which is costly to the owner and to the progress of the job being done.

Most manufacturers today are providing, through their distributors, complete and comprehensive operator's manuals, service bulletins and other valuable printed



information, well illustrated. However, the best of this, when hidden in a filing cabinet, is a total loss to the personnel operating the equipment. The knowledge contained in this printed matter must be made available to the people responsible for the continuous operation of the equipment. Group meetings of those responsible for the maintenance of your equipment should be arranged. The manufacturer and

distributor will cooperate to the fullest on these service meetings.

A planned maintenance program will insure continuous productive use of equipment. It will give a minimum of lost time, maximum production and a great reduction in parts and maintenance expense. But the program must be planned so to function that minor mechanical difficulties can be detected at their beginning and remedied immediately. To attempt to set a program to fit each operation or each owner would be impossible. The best that can be done is to establish signals along the trail.

The first requirement of the program is definitely an organization. It must be trained to follow a planned program of periodic inspections, lubrication, and maintenance or service repair of the equipment. And it must have the will-to-do. Certain definite responsibilities must be established and adhered to. The top man on the job—the owner, foreman or superintendent—is first in line and must be the directing head. He has responsibilities to assume, and in him rests the success or failure of the undertaking. He pays the freight.

He must, either through his own efforts or through those working with him, see that proper service information is brought to the attention of his maintenance organization. And this means both written and oral information. Group meetings are always profitable. The organization must be kept up to date on equipment changes, or improvements in methods of carrying out the various preventive maintenance procedures.

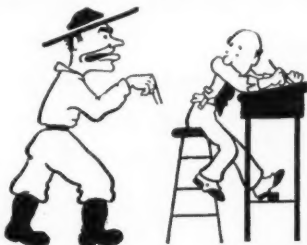
He must insist upon good house-keeping. Whether in the shop or field, dirty working conditions most certainly do not lend themselves to good work on present-day high speed equipment. In the field it is a problem, and a bad one. In the shop there is no excuse for dirty working conditions.

The execution of the program requires paper work: reports, and

entering of data on check sheets. The top man must check these periodically to see that the reports are being made. (And Brother, do mechanics like to make reports and do paper work!) He must of necessity spot-check operations to see that the work and the reports are in balance. Remember, it is possible for the mechanic to enter a check on a check sheet yet fail to grease a pilot bearing.

While the boss lolls around the office visiting with salesmen and wondering why the hell he ever got into this kind of business, somebody must do some work. So he has a maintenance crew. Probably he has a master mechanic, a mechanic and a lubrication man or grease monkey. Responsibilities must be assigned to this crew, and individual duties to each man.

To the master mechanic falls the duty and responsibility of having all equipment in running condition at all times. Where shift work is being done, he should arrange his hours to overlap the shifts around him so as to pick up and disperse information between the shift crews. He must be available to take care of any breakdowns and to make minor repairs and adjustments. He is responsible for the



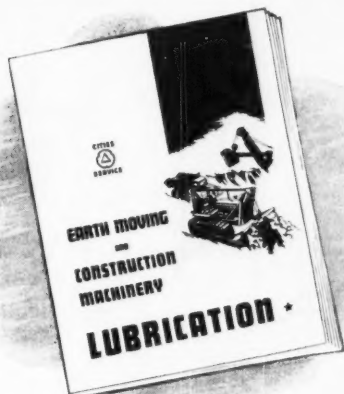
keeping of necessary records which show the various operations to be performed and the time cycle at which they are to be carried out.

He must be on the job before the operators take off so as to check the mechanic's or inspector's reports as to the condition of each piece of equipment before it hits the job

(Continued on page 106)



# Best-Telling Book



YOUR TYPE of construction equipment—engines included—is plainly, soundly covered in this book. You'll be able to judge for yourself which types of lubricant best suit various machines and conditions. You can make your own point-by-point check-up on the complete line of Cities Service lubricants—engineered in types and grades sure to be more than a match for fierce loads, weather and terrain. The performance records prove how sharply maintenance costs go down... how steadily grueling schedules are met... with Cities Service lubricants on the job. Call the nearest Cities Service office for competent aid, or write us direct.

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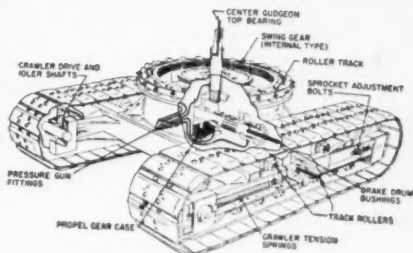
Compressor Oils    Hydraulic Oils

Multi-Purpose  
GEAR OILS

HEAVY DUTY MOTOR OILS

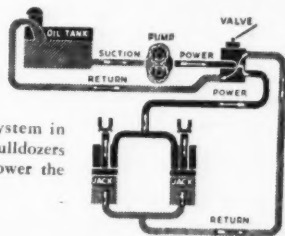
## CONTENTS:

**WHAT** LUBRICANTS  
FOR WHAT APPLICATIONS  
—AND **WHY**



"FIG. 23

Shows internal type open gears of swing rack and one method of lubricating trunion and other shaft bearings... The 'propel' gears are enclosed and oil lubricated. The crawler track and other parts lubricated through pressure gun fittings require grease. See lubrication chart for proper type and grade...



"FIG. 33

Hydraulic system in use on some bulldozers to raise or lower the blade."

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(Continued from page 104)

for the day's work. He needs and must get information from the operators about any points that they think need attention. The master mechanic must know that crankcase lubricants and cooling systems are ready to go. All units should be started and properly warmed up. The warm-up period is of great value to an engine, and too little importance is given to it. This is also the time to check for oil and coolant leaks. He can utilize his "spare" time to complete any unfinished work on the job. He has the records of others to check, parts to order and supplies to be kept in stock and available. Maintenance check charts must be checked, and periodic schedules established and followed. He must catch equipment at operators' lunch period to make checks on lubricants and radiator solution etc., while the unit is idle. This saves on downtime. Various lubrication and inspection operations must be planned so as to take place between shift changes or on normal downtime. These operations must be noted on a check sheet so that the super can follow the program.



He also should have the responsibility of checking on ability of operators and the manner in which they are handling the equipment. Many difficulties are brought on by poor operators mishandling good equipment.

On multiple-shift jobs it is generally the practice for the master mechanic and the following shift mechanic to over-lap shifts so that information pertinent to the operation can be exchanged. The mechanic can, of course, when not busy at regular mechanical work assignments, assist the lub man in his duties. He can see that daily maintenance checks are made and properly recorded on the maintenance chart provided. He also makes notes of parts and supplies needed.

The lubrication man on any job can be an important asset to the job. His daily tasks are: changing and adding motor oil to crank-

## LUBE CHART

Crank Case  
Oil Filters  
Air Cleaners  
Crank Case Breathers  
Gear Boxes  
Grease Fittings  
Wheel Bearings  
Tire Pressure  
Batteries  
Check Coolant

### MAKE A REPORT !



cases; checking cooling system; transmissions and final drives; changing oil and fuel filters. Performing these various daily and weekly lubrication jobs, he can be trained to have an open eye for mechanical defects and items that need attention and correction. He can be a great help to the mechanical force by noting these defects. This is also the opportunity to bring up mechanics to your own standards of operation and training.

The lubrication man should be provided with a routine to follow for each cycle of maintenance procedures. Here is a suggested list that can be varied to suit the job:

Crankcase lubrication quantities  
Change oil  
Service the oil filters  
Service air cleaners  
Crankcase breathers  
Service pre-cleaners  
Check gear boxes  
All Zerk fittings  
Service wheel bearings  
Check tires  
Batteries  
Fuel the units  
Check coolants  
Keep daily lubrication report  
Assist mechanic when not otherwise occupied

Any preventive maintenance program takes planning and the will to follow through. The lubrication section of the program is vital to the continued trouble free operation of the job. If the job is such that many units are involved, the work area should be laid out to follow production line techniques as nearly as possible. Establish a routine so the various operations can be carried out without lost motion. That is, without re-routing equipment through the area, or back-tracking. After all, a good mechanic or lubrication man

can only sell you his time and knowledge. The way that time is utilized is profit or loss to you. In other words, the time they sell to you must be handled in such a way that it will return you a profit on that investment. And this is a detail that needs the attention of the management on the job, and the backing of the front office.

Whenever a piece of your equipment, regardless of what it is, is to be out of operation for longer than a month it should be given the care that it is entitled to. Otherwise, trouble may develop when the rigs are re-activated. And it's usually caused by faulty storage. In any event you should, in your preventive maintenance program, provide for proper storage of that equipment. Basically the procedure is the same on all types of machines. Here are a few items to be looked after. (Incidentally all major manufacturers outline a storage procedure in the operator's manual. Use it.)

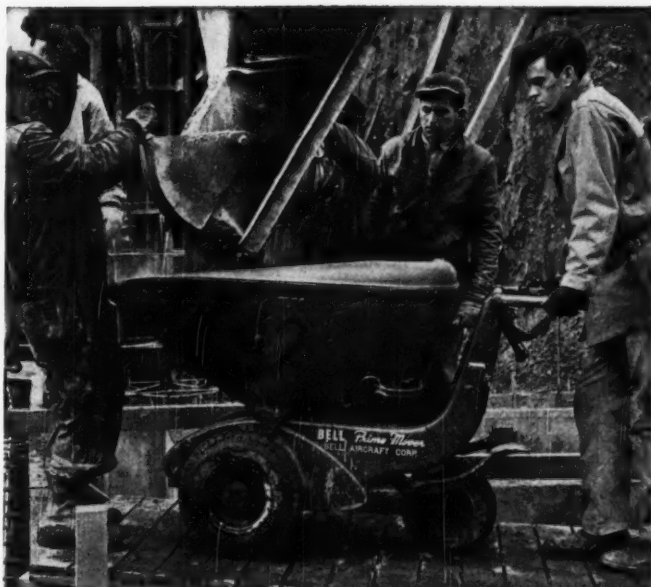
Crankcases should be drained while the engine and oil are hot, then refilled with clean oil. Gear boxes should have the same attention. Cylinder walls should be coated with heavy oil so as to retard the corrosion and rusting which is caused by temperature changes depositing moisture on working parts. Cooling systems should be completely drained for freezing weather storage unless suitable anti-freeze solution is in the system. Batteries should be removed and properly stored; if possible kept on a trickle charger or at least kept in a charged condition. Open gears and drive chains should be cleaned and coated with a good lubricant to prevent rust

and deterioration. Rubber tires on equipment need preparation for storage. The weight should be removed from the tires as much as possible and the air pressure lowered to about 50% of normal. Tires which are exposed to hot sun for prolonged periods should be shielded from the heat. Idleness does great damage to rubber tires.

Naturally, when equipment is down for normal season-end storage, the unit should be given the works in so far as preventive maintenance is concerned. The entire machine should be inspected and all necessary repairs made before it is put into dead storage. Storage of your equipment is important to you. There is no one item in a good preventive maintenance program that can be slighted, and putting equipment into storage and its removal therefrom are important.

A recapitulation shows that the most important item is that management must be thoroughly sold on the preventive maintenance program if it is to be effective. It must have a continuous follow-up by management until such time as the procedure becomes habit. The best thing for any program is to get into the habit of doing it the right way and then it soon becomes automatic. A certain amount of accounting is necessary in the matter of keeping records of the various maintenance follow-through procedures. Lubrication and maintenance charts must be provided for guidance. A constant study of the procedures involved must be made so that improvements in the program can be made to eliminate lost motion and time. You buy time, knowledge and loyalty from your maintenance crew, and that purchase must be capitalized. Proper utilization of their time is your profit.

A preventive maintenance program is for one purpose only—to add to your operating profits. Therefore, it is entitled to earnest study and administration. It will take the complete cooperation of your entire organization. It will require assistance from your distributor and manufacturer. And they will be happy to work with you. Owner, distributor and manufacturer. (Continued on page 110)



The Prime Mover multiplies one man into four. Compactness allows accessibility into close quarters, from basement to top floor.



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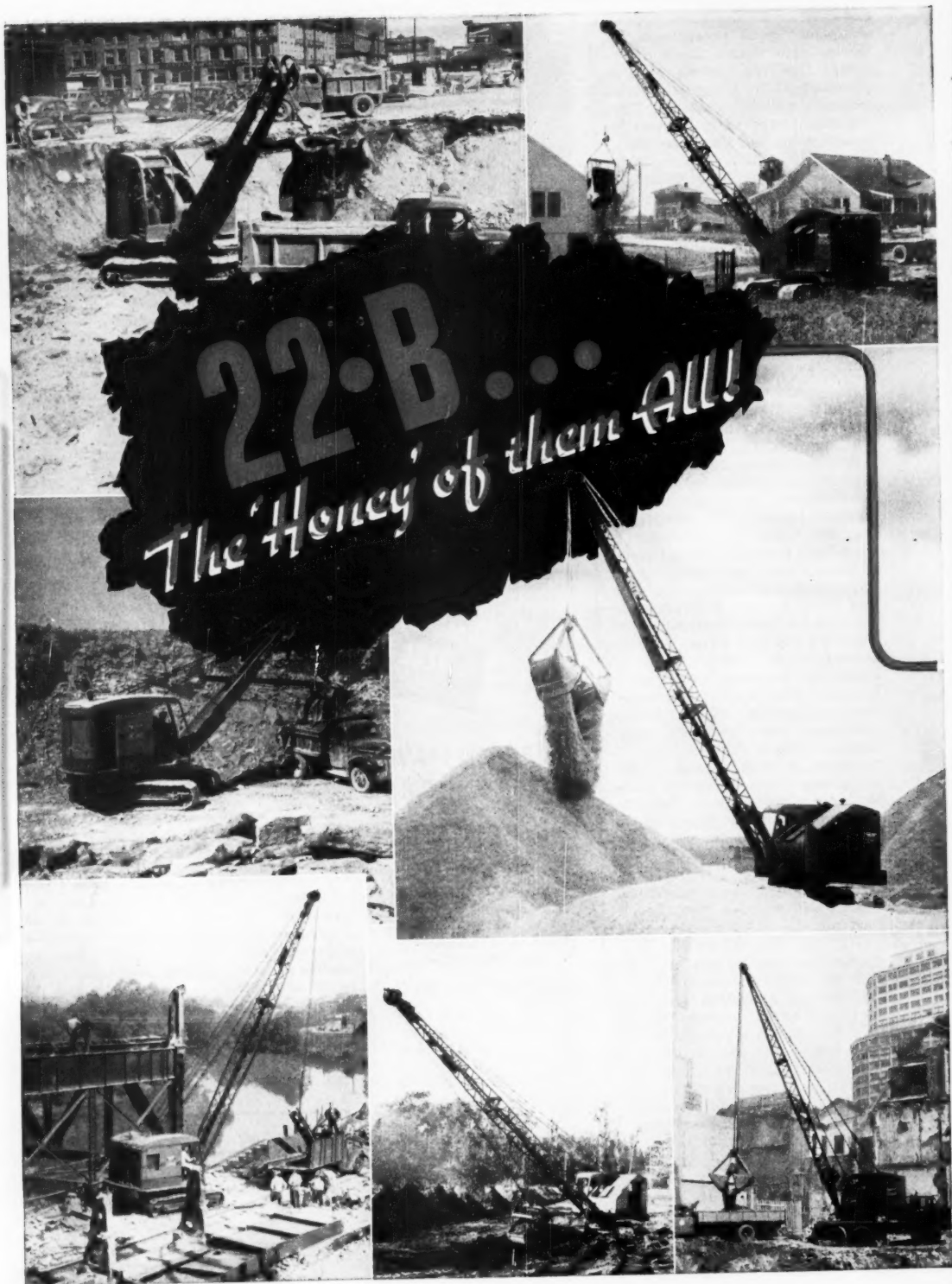
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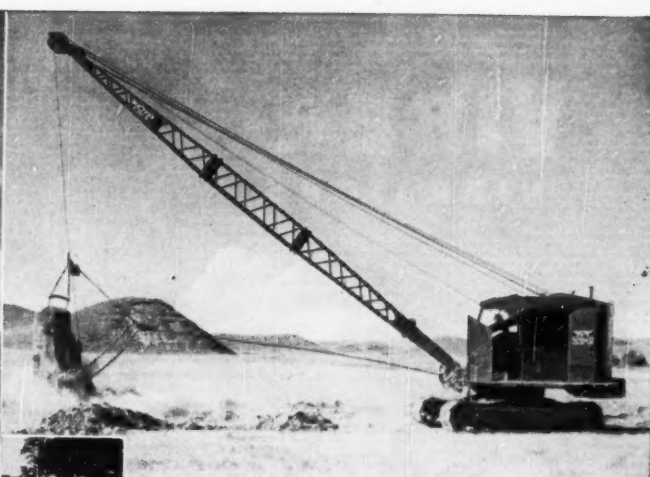
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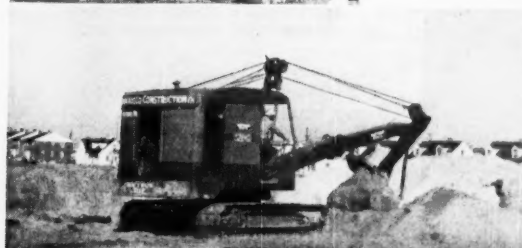
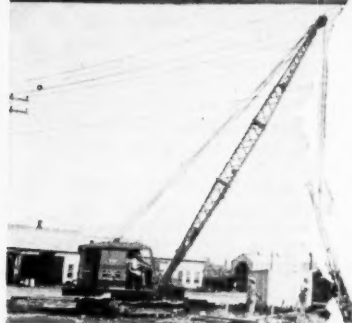


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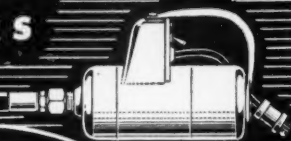
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(Continued from page 107)

facturer are a team. One cannot stand without the other. Preventive maintenance is a big job, and profitable, if you utilize all its possibilities. Four mules and a Fresno scraper needed little service. They also moved little dirt. High speed rubber-tired scrapers and pusher tractors need service. But how they make that dirt fly!

## Rock Drills

(Continued from page 63)

old pipe expensive, but scaly pipe and rotten hose will clog up a drill or the strainer if one is used, and score the cylinder. Replace pipe and hose when necessary, and keep your air lines clean. Blow them out thoroughly at the beginning of each shift so there is less danger of dirt and scale getting into the drill. Also be sure the air connection on the drill is clean before attaching the hose.

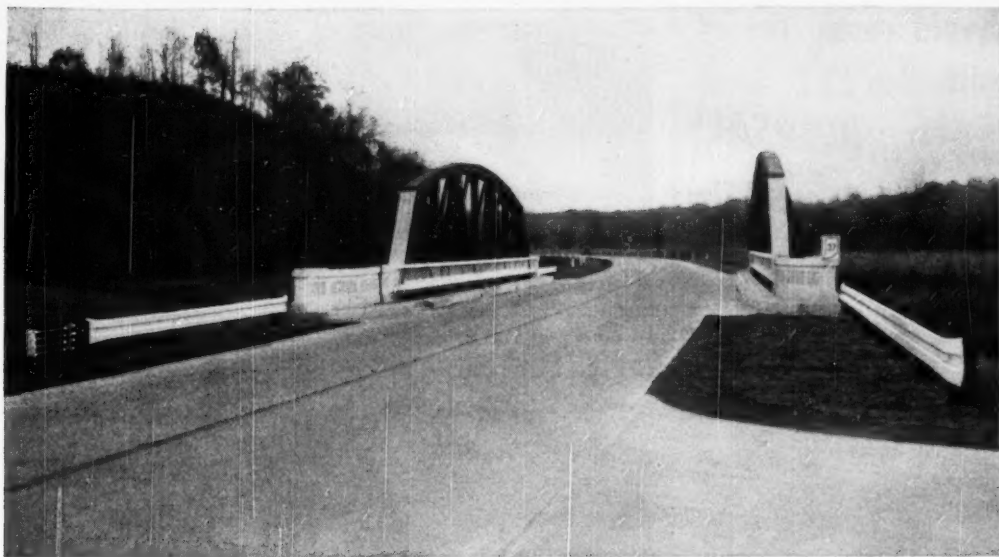
Though a rock drill is a sturdy piece of machinery and is designed to take a lot of punishment, it is also a precision instrument and can be injured by rough treatment. Hammering the drill by the operator with a wrench or piece of drill rod to free a stuck steel will cause damage, and hammering the front-head causes chuck housing breakage. A heavy blow on a drill cylinder may dent it. This sometimes affects the travel of a piston and may crack a cylinder.

Air pressures from 80 to 100 psi will usually operate rock drills at maximum efficiency. Air pressure that is too low causes a drill to work too long to make its footage. Under such conditions low air pressure is harmful rather than helpful.

Water pressure should not exceed air pressure, otherwise water will be forced into the cylinder and carry away lubricant. Smaller hose or a reducing valve may correct excess water pressure.

Improperly heat-treated drill shanks are another common cause of rock drill breakage, especially if they are too hard. Follow manufacturer's instruction for heat-treating shanks.

Properly taken care of, the rock drill is a dependable and efficient construction tool. Given a decent chance to do so, it will turn out thousands of hours of hard service without trouble.



Bethlehem Safety-Beam Guard Rail at bridge approach on Route 37, between Martinsville and Bloomington, Indiana. Contractors: William D. Vogel, Indianapolis, and Rieth Riley Construction Co., Goshen, Ind.; Guard Rail Erector: James H. Drew Corp., Indianapolis.

## For Extra Protection Use Safety-Beam

To provide extra protection for motorists, use Bethlehem Safety-Beam Guard Rail at sharp turns, embankments, bridge approaches and other dangerous locations along highways.

Bethlehem Safety-Beam Guard Rail provides maximum safety at highway danger points for two reasons: (1) strength, and (2) ability to absorb impact. Safety-Beam consists of heavy sections of steel plates, bolted together on steel posts to form a continuous, impact-absorbing beam. When a vehicle strikes Safety-Beam, impact is absorbed by several posts, making it virtually impossible to crash through the rail.

Safety-Beam is easily visible at all hours. It can be installed quickly, too, even by unskilled labor, for it fastens to steel or wood posts with but one bolt. No

end anchor rods, special tools or complicated adjustments are required. Safety-Beam regularly comes in easy-to-handle 12 ft, 6 in. lengths, but is also furnished in longer lengths.

Our Folder 545 gives standard details and assembly plans for Safety-Beam Guard Rail. For your copy, contact the nearest Bethlehem sales office. Or get in touch with us at Bethlehem, Pa.

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Fastening Safety-Beam Guard Rail to Bethlehem steel post on Route 3 by-pass, in vicinity of Concord, N. H. Contractor: Peter Salvucci, Waltham, Mass.; Guard Rail Erector: Costantino Bros., Inc., Providence, R. I.

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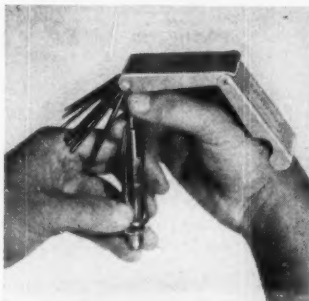
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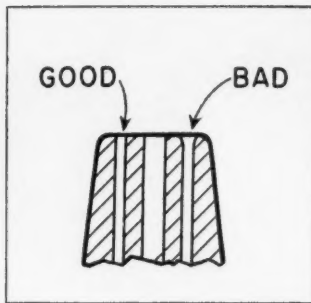
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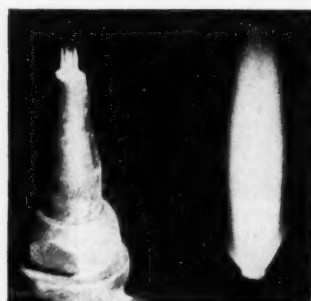
Square up the end to get . . .



Ream holes. Result is a . . .



Un-bell'd passages, then . . .



Proper flame for smooth cut.

## **How to Clean Tips and Nozzles For Better Welds and Cuts**

GOOD RESULTS as well as personal safety in welding and cutting depend, among other things, upon an accurate flame adjustment. And you need a clean tip or nozzle to get that proper flame adjustment. Here is the procedure for cleaning a cutting nozzle that is badly clogged with slag. Similar steps should be followed for cleaning a welding tip. The method is recommended by Linde Air Products Co., who supplied the accompanying information and photographs.

First, prepare a solution of 20 parts of water and one part of a good nozzle cleaning compound that you can get from your welding supply jobber. Place the nozzle, with any others that need cleaning, overnight in this solution. In the morning, rinse the nozzles in clear water and allow them to become thoroughly dry.

Now square up the flame end of the nozzle by rubbing it on fine emery cloth. Hold the nozzle perpendicular to the cloth and use long

straight strokes. Be sure the flame end is square and free from scratches.

Passages must be clean, smooth, and of the correct size. Bell-mouthed passageways will cause the flame to snap out when the blowpipe valves are closed, so rub the flame end of the nozzle on the emery cloth until the bell-mouthed condition disappears.

Next get out your tip cleaners. Start with a tip cleaner a size smaller than recommended in the blowpipe instruction booklet and work it up and down in the preheat and cutting-oxygen orifices. Do not twist the cleaner. When it slides freely, change to the recommended size cleaner.

After cleaning, insert the nozzle in a blowpipe and light. Then examine the flame. The preheat flames should be the same size and shape, and the cutting-oxygen jet should be straight and symmetrical. A flame of this type will help insure a smooth cut.

# Announcing

## The New **BLAW-KNOX** **CONCRETE BUCKET**

for handling of low slump concrete containing large aggregates and air-entraining agents

### MEETS ALL THESE REQUIREMENTS

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- Air-operated discharge gates are positive and quick acting in opening and closing
- Buckets are equipped with hook-on attachments for crane or cableway, conveniently located for rapid attachment and detachment
- Buckets are light in weight yet sturdy enough to withstand the abuse encountered under construction conditions

HERE'S the new Blaw-Knox CAC Concrete Bucket, equipped with air-operated clam gates, and designed for high speed, economical operation on big-job specifications calling for coarse aggregate of 6" size, and air-entraining agents which make concrete more sticky than normal. The model CAC Concrete Bucket is specifically designed for low cost handling and placing of this harsh, low slump concrete for mass concrete construction on U.S. Engineer, Bureau of Reclamation, etc., projects. Exclusive Blaw-Knox features include: larger water level capacity; larger discharge openings; faster air-operated gates; rectangular discharge openings (instead of circular) to prevent arching of the harshest, lowest slump concrete over the discharge throat. Model CAC Concrete Buckets are furnished in 2, 3, 4 and 8 cu. yd. sizes. The 8 yd. model is supplied either as a two compartment or single compartment bucket.

Write for Bulletin 2331 for full information, specifications and dimensions.

### THERE'S A BLAW-KNOX "COMPLETE PACKAGE" TO MEET EVERY CONSTRUCTION NEED

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A low cost unit for handling concrete of normal consistency on general construction work, and especially adaptable to narrow form work. Operator can work the discharge gate lever while straddling the forms. Gate operation is easy and convenient. Furnished in 1/2, 3/4, 1 and 1 1/2 cu. yd. sizes.



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# Cranes and Shovels

(Continued from page 60)

ing is resting on firm, level ground.

b. With boom extended directly over the side of crawler (or side of rubber-tire unit) raise the load or bucket about 3 ft above ground.

c. Hold load or bucket in suspended position and, at the same time, slowly lower the boom until the machine just starts to tip. Then raise boom slightly.

d. Swing turntable at the same swing speed you will use when op-

erating. Hold foot on main hoist foot brake, ready to drop the load or bucket in case the machine starts to tip. As the load swings away from the machine due to centrifugal force, it may cause machine to tip, although there was no indication that it would tip when not swinging.

e. If possible, swing the load or bucket clear around to complete the circle. Then swing in opposite direction.

f. After swing test is completed, raise the boom about 2 ft to give added stability and factor of safety.

(2) Be sure the crane is reeved

up with the proper parts of line recommended for the load to be lifted. The heavier the load the more parts of line will be required. Don't take a chance on dropping a load and snapping the boom back over the cab.

(3) Do not propel the crane with boom at a high angle.

(4) When traveling with load suspended, snub load to turntable to keep it from swaying out and upsetting machine.

## Shovels

(1) See that the shovel dipper is adjusted for proper digging angle relative to dipper stick for the type of material being handled. Use inner set of holes on pitch braces for digging easy materials, low cuts or for grading. Use end set of holes on pitch braces for harder digging and for higher banks.

(2) Avoid sweeping the dipper back and forth like a broom in order to level off ahead of machine. This causes side strains and wear on the shovel boom, dipper stick and dipper.

(3) Avoid striking the boom with the dipper. Such practice will eventually damage the equipment.

(4) Avoid crowding the dipper stick until the dipper stick stop at rear end of stick strikes the shipper shaft sleeve.

(5) Avoid striking dipper on tread belts. This practice causes damage to dipper and stick as well as treads.

(6) Avoid excessive shaking of dipper to dislodge spoil or stones. This causes damage to door, hinges and other mechanisms.

## Draglines

(1) Use a dump cable of proper length when making replacement. If dump cable is too long, it becomes necessary to pull the loaded bucket close up to the fairlead to keep it level. Too long a dump line also causes bucket to dump before it gets out under the boom point for maximum reach.

(2) Avoid piling up excessive dirt in front of dragline. Piling under boom foot wastes time and power. It also makes an excellent trap to wear out the drag-in cable.

(3) Dirt and mud brought in by drag cable should be removed from fairlead and surroundings.

## DRIVING EXTRA-LONG TUBULAR PILES

These 75-foot tapered, fluted, tubular piles with 20-foot extensions were driven to a minimum bearing of 40 tons each by a McKiernan-Terry No. 10-B-3 Double-Acting Pile Hammer, in constructing the new highway bridge at Spring Lake, Mich. Luedtke Engineering Co., contractors.



To insure accurate driving, as well as protection from damage during driving, a McKiernan-Terry Hammer was the contractor's choice for handling these long, costly piles.

For through the past fifty years, whether for driving timber, steel sheet, concrete or pipe piles, contractors have more and more grown to depend upon these powerful, safe-to-operate hammers to "deliver the goods".

There are ten double-acting hammers, five single-acting hammers and two double-acting pile extractors in the standard McKiernan-Terry line. This makes possible always the selection of a right hammer or extractor for any specified pile-handling conditions.

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MK-370 A

**MCKIERNAN-TERRY CORPORATION** Manufacturing Engineers 14 PARK ROW, NEW YORK 7, N. Y.

**McKiernan-Terry** PILE HAMMERS AND EXTRACTORS

(4) Avoid pulling the bail socket into the fairlead.

### Backhoes

(1) It is not advisable to use the hoe boom and extended dipper as a pick to pry loose hard materials. If this is done, dipper arm may hit topside of boom and cause damage.

### Rubber-Tired Machines

(1) On truck cranes always double-clutch when shifting transmission gears.

(2) Watch air brake pressure. Run chassis engine as necessary to maintain proper air brake pressure.

(3) Never rely on air brakes to hold unit when parking. Always use hand parking brake. In addition, block wheels if on grade.

(4) Maintain proper engine idle speed to charge battery. When carrier engine is permitted to idle for long periods during operation, maintain a sufficient idle speed to enable generator to charge battery at a rate of at least 2 amp.

(5) Maintain proper tire inflation. Check daily and maintain proper tire inflation in all wheels for longest tire life and for best operation, particularly when working on rubber without outriggers.

(6) Always use air brakes to stop self-propelled unit.

(7) Drain all air reservoirs daily. Always drain the air tanks or reservoirs daily to keep them clean. In cold weather, drain them immediately after shutting down to avoid freezing.

### Crawler Travel

(1) Whenever practical, especially when moving the machine fairly long distances, travel with the front of the crawler pointed in direction of travel. In this position, the driving rollers are at the rear. The tread belts are then taut on the bottom, which produces the most effective transfer of driving power and causes the least wear on driving rollers and treads.

For occasional short moves, the crawler may be traveled in the direction of the rear end without causing serious wear on the mechanism.

### General

(1) Avoid greasy floors. Keep turntable floors free from grease and mud so as to prevent slipping and falling.

(2) Idle engine when shifting jaw clutches. When shifting the jaw clutches throttle engine down to idle speed before engaging or disengaging sliding jaw clutches.

(3) Always idle engine before stopping engine. The engine should always be throttled down to idle speed before turning off the ignition switch.

### Make Proper Adjustments

By keeping the machine in proper adjustment, much wear and tear and resulting time losses may be prevented. It's a case of a "stitch in time saves nine." Here are some ideas:

(1) Keep brakes and clutches adjusted properly. As soon as clutches or brakes show signs of slipping, adjust them promptly.

(2) Keep all chains in adjustment per manufacturer's recommendations.

(3) Tighten U-bolts. After the new unit has had an initial run of approximately 30 days, tighten all U-bolts to reset them and to take up any slack due to initial strains. Check, tighten and reset U-bolts periodically.

(4) Tread belts and drive roller chains should be checked and adjusted as one operation. Both are subject to constant wear, inasmuch as they must carry and propel the weight of the entire machine. Always adjust drive chains first, then follow with tread belt adjustment.

If drive roller chains are too loose, they will drag on the wear plates of the frame, and will slap and jerk when machine is started or stopped. If drive roller chains are too tight, they will cause excessive wear on drive rollers and other drive mechanisms. If one drive chain is too tight and the other too loose, steering will be affected.

If tread belts are too tight, there will be excessive wear on tread shoes and tread pins. If tread belts are too loose, they will drag on the frame, causing excessive wear. Do not tighten treads until they are taut as there should always be some slack for efficient operation and reduction of wear. Adjustments given in instruction books are usually for working on firm ground, concrete or mats. For gravel, sand, cinders, mud and loose materials, a looser tread belt should be carried to prevent damage in case loose material packs around driving sprocket.

(Continued on page 116)

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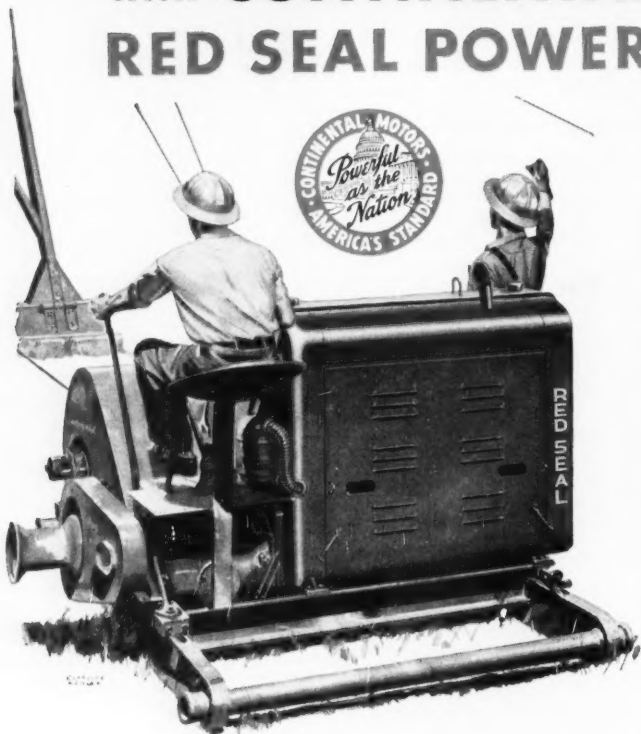
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IN PARTNERSHIP WITH AMERICA'S LEADING  
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## *Continental Motors Corporation*

MUSKEGON, MICHIGAN

(Continued from page 115)

### Lubrication Most Important

This subject is extremely well known and understood, yet its full impact on Preventive Maintenance is missed in many cases. Proper lubrication can accomplish as much toward Preventive Maintenance as all other factors put together. Though of vital importance, this subject can be covered by adherence to these three simple rules:

(1) Set up a definite interval in the day's work schedule during which the machine is shut down and lubricated thoroughly in accordance with the manufacturers' recommendations. Make one person responsible for this daily routine.

(2) Use only those lubricants recommended by the manufacturer in his instruction manual. Don't guess.

(3) Apply such lubricants in the schedule recommended by the manufacturer in his instruction manual. Know! Don't guess!

### Pay Constant Attention

During the operation of the machine, even if all the foregoing suggestions are carried out, there will be certain circumstances that will come to the operator's attention. It may be a new sound, a vibration, a loose part, a difference in the feel or response of the machine. To complete the program of Preventive Maintenance we recommend these closing suggestions:

(1) Investigate anything new or different that you notice about the machine or its operation.

(2) If you can't find out what it is, check the manufacturer's instruction book or call it to the attention of the master mechanic for his attention.

Remember a small repair job, done in time and when it's first required will prevent a minor trouble from developing into a major overhauling job. Many of the items that require attention under a sound program of Preventive Maintenance appear to be mere trifles—but they are really tremendous trifles because taken in the aggregate, they will pretty well determine the kind of performance your machine will turn out, and how long it will stand the gaff on the job.

Davis Construction Company, Hicksville, N. Y., has recently completed the new Veterans Memorial Highway between Commack and Patchogue, L. I. The photographs show part of the Davis earth-moving equipment on this job. Cost of the new through-way, \$1,500,000.



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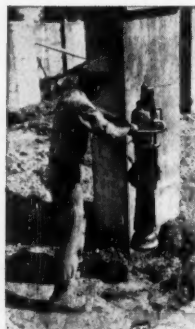
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# FOR SOIL COMPACTION WHERE ROLLERS CAN'T GO!

*The Barco Pegson Rammer*



This self-contained, portable rammer is specially adaptable to tamping close to abutments and other wall structures, in narrow ditches and trenches, thus eliminating troublesome settlement areas. Actual field tests, certified by Government agencies, have proved that one man using

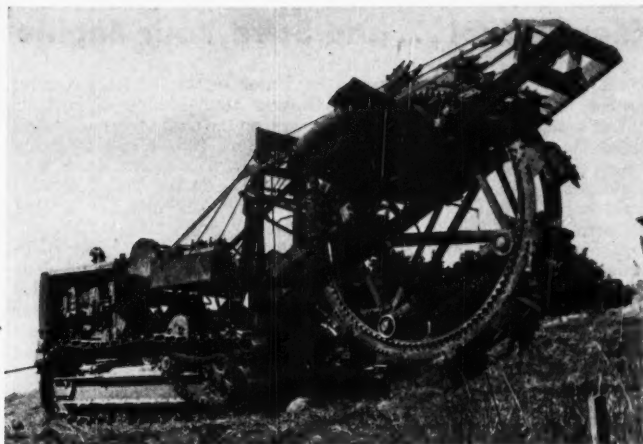
the Barco can do *the work of five* who use conventional equipment! This economical machine is easy to operate—no lifting, no strain, no vibration. A slight tilt on the handle will “walk” the Barco wherever you want it to go. Don’t tie up your funds in heavy equipment—order Barco today. Write for free demonstration or catalog to Barco Manufacturing Co., 1812H Winnemac Avenue, Chicago 40, Ill.



## **BARCO** *Gasoline Rammer*

In Canada: THE HOLDEN CO., LTD., MONTREAL, CANADA

FREE ENTERPRISE . . . THE CORNERSTONE OF AMERICAN PROSPERITY



IT MAKES NO DIFFERENCE what type of ditcher teeth your machine takes; a hard facing may be applied in a very short time which will greatly lengthen their life span.

## Want to Save Money? Try Hard-Facing Ditcher Teeth

GETTING DOWN to plain dollars and cents, here's a case where 21c worth of preventive maintenance on ditcher teeth increased their service life 300 to 400%, cutting their cost per lin ft of trench down to one-third. Can't be done, you say? Here's how, as reported in a recent issue of Fusion Facts, house organ of the Stoodly Company, Whittier, Calif.

A.B.C. Construction Co. of Los Angeles was using standard 12-bucket diggers with 5 teeth per bucket on their government pipe line job near Los Alamos, N. M. Ordinary teeth cost 45c each and lasted usually through only 200 ft of the extremely abrasive tufa rock on the project. The unit cost per tooth per lin ft was therefore .225c.

When faced with 30-40 Tube Borium at a cost of 16c and proper-

ly heat-treated at an additional cost of 5c, each tooth, now costing 66c total, averaged 600 to 800 ft through the same cemented-sand soil. Thus the service life increased 300 to 400% while unit cost dropped to less than 1/10 of a cent (0.94c).

Using 30-40 Tube Borium, a single pass approximately 3/4 in. wide is applied to the top side of each tooth point by the oxyacetylene method. The application cannot be repeated since by the time the hard metal deposit is worn off, backs of the teeth have also worn to a point where rebuilding is impractical.

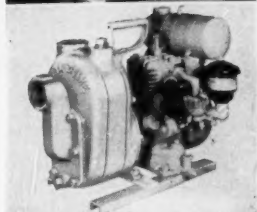
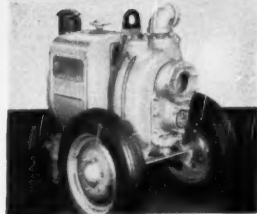
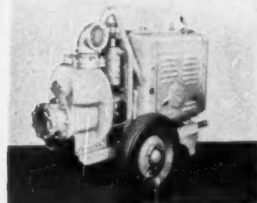
Results: Increased service, lowered unit costs and less stop-time for replacements. To date, the company has used more than 10,000 hard-faced teeth on the Los Alamos job alone.

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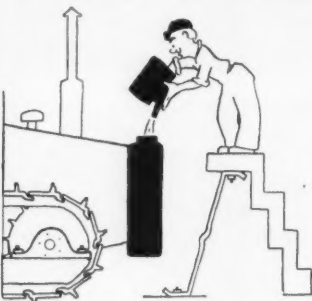
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## Keep It Cool ... and Save Your Engine

HERE ARE SOME TIPS on preventive maintenance for engine cooling systems. With hot weather already here, making perfect functioning of the cooling system vital, it will pay to follow them. The tips have been prepared by Allis-Chalmers' Tractor Division Service Department, and are printed through courtesy of the A-C "Reporter."

Keep the cooling system filled with clear water that is free from lime or alkali. The use of water



containing lime will result in lime deposits in the cylinder head and block, causing hot spots in the engine and eventually restricting the water passage. Alkali in the water will cause a corrosive action detrimental to various parts of the system.

In hot weather it is important that special attention be given the fan belts and air passages through the radiator core. Adjust the fan belts to proper tension and replace any worn or damaged ones. If two



or more are used side by side, be sure they are the same length, otherwise the shorter one will take all the load and wear out rapidly.

After you are sure the water level is right and the fan belts are properly adjusted, next check the external condition of the radiator if overheating is experienced.

If the radiator core is clogged with dirt and debris such as grass and leaves, clean it with a stream

of water or air under pressure. Only a thin coating of dirt or grease on the cooling fins and tubes will reduce the cooling efficiency considerably. It is important that the exterior of the engine be kept free from thick deposits of dust and oil.

Deteriorated or collapsed water hoses will restrict the water flow.

If overheating persists, inspect the water pump impeller for wear and corrosion. Wear may be caused by sand, rust and other abrasive materials. Corrosion may be due to lack of inhibitor in the water.

The cooling system should be maintained at about 160 deg. to 185 deg. F. to insure complete combustion and prevent sludge and gum deposits within the engine.

Maintaining the correct cooling system temperature depends mostly upon proper functioning of the thermostat. Check the thermostat if the engine temperature cannot be maintained in the normal range.

To check a thermostat without removing it, operate the engine to see if the water within the block



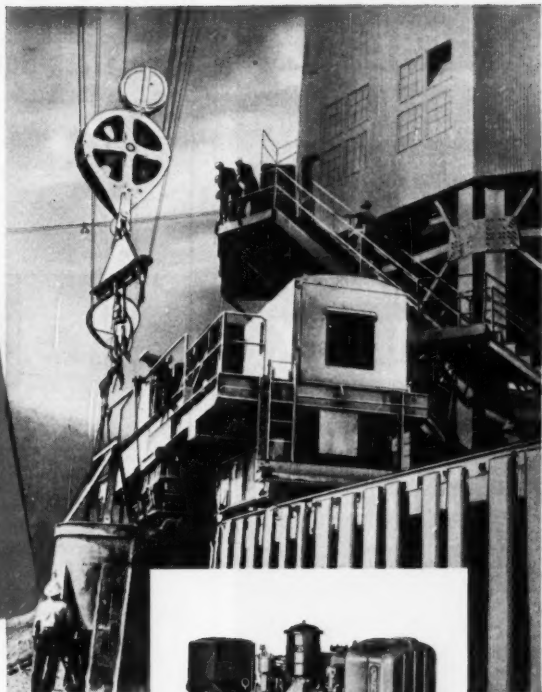
and cylinder head warms up while the water in the radiator remains cold. If water in the radiator warms up as quickly as that in the cylinder head, the thermostat is stuck open. If it is stuck closed, the thermostat will not open although the water in the engine becomes extremely hot while at the same time the water in the radiator will remain cold.

To check a thermostat out of the engine, heat a container of water in which the thermostat and a suitable thermometer have been immersed. When the water has reached a temperature of 150-160 deg. F. the thermostat should begin to open. The thermostat should be wide open at about 185 deg. F. Stir the water to obtain a uniform temperature.

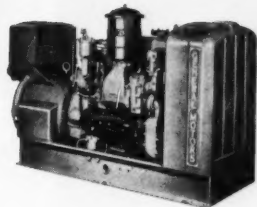
If the thermostat is corroded and stuck or if the bellows of the unit leaks, install a new unit.

# A CONCRETE Case for

## GM DIESEL POWER



*Built by Washington Iron Works, Seattle, the concrete cars at Hungry Horse Dam have a top speed of 5 m.p.h. with a capacity pay load of 32 tons. Each is equipped with a 4-cylinder GM Series 71 Diesel generator set furnishing power to two 20-h.p. traction motors.*



**T**HREE specially built Diesel-electric concrete cars, used by the General-Shea-Morrison group at Hungry Horse Dam, are a vital link in the carefully planned facilities with which the contractor expects to place a million cubic yards of concrete this year.

Carrying two 8-yard side dump hoppers, the cars move concrete from the mixing plant to points directly under cableways where they discharge into buckets. This eliminates time lost moving buckets on and off cars—saves travelling time of the 500-ton cableway tail towers—increases cableway capacity by at least 25%.

It's a job that calls for smooth coordination. There

can be no failure or falter. Shutdowns would be costly. So General Motors Diesel generator sets were a natural choice to power these cars.

Because they are 2-cycle, with power at every downstroke, GM Series 71 engines are compact, smoother in operation and quicker starting. They are designed for easier servicing; have no high pressure fuel lines and offer maximum interchangeability of parts.

Add to these advantages their higher power-per-pound, their economy and rugged durability, and you'll see why contractors everywhere are turning to GM Diesels. Get the full story from your local equipment dealer or write direct to us.

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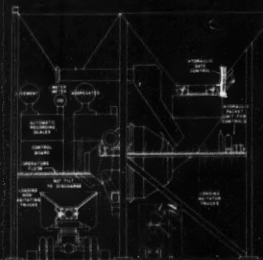


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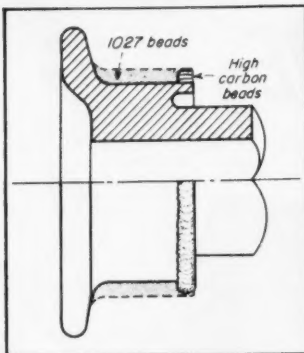
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## How to Re-Weld Worn Track Rollers



TO OBTAIN a square shoulder on heavily worn tractor track rollers being manually rebuilt, the following procedure has proved helpful.

First, clean the roller properly and mount it in a suitable turning jig for down-hand welding. If the roller being worked has anti-friction bearings, immerse it in water during welding. Hard-facing should not ordinarily be attempted on cast-iron rollers.

### Weld Shoulder First

Following preparation, build up the shoulder of the worn roller electrically to within one bead thickness of the desired height with Stoddy High Carbon, as shown in the accompanying sketch. Then, complete the application using 3/16-in. Stoddy 1027. A large crawler tractor roller will normally require from 6 to 8 lb of material. The amperage recommended for the 3/16-in. electrode is from 140 to 220, and the application can be either ac or dc, straight or reverse polarity.

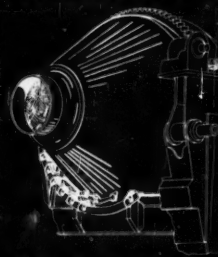
Since tractor rollers are ideally suited to automatic hard-facing, the mechanical method is advisable where the necessary equipment is available.—From *Fusion Facts*

### Sorry...

Lima Shovel and Crane Division, Lima-Hamilton Corp., tells us we slighted their big type 1201 shovels in our June story on Canada's Des Joachims Dam. The rigs carry a 3½-yd dipper, not the puny 1½-yd job we credited them with.

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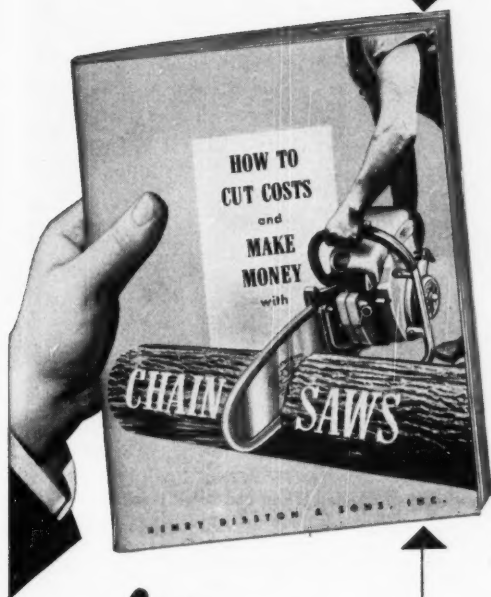
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# CONSTRUCTION EQUIPMENT NEWS • • A Preview of

By MELVIN DEAN, Equipment Editor

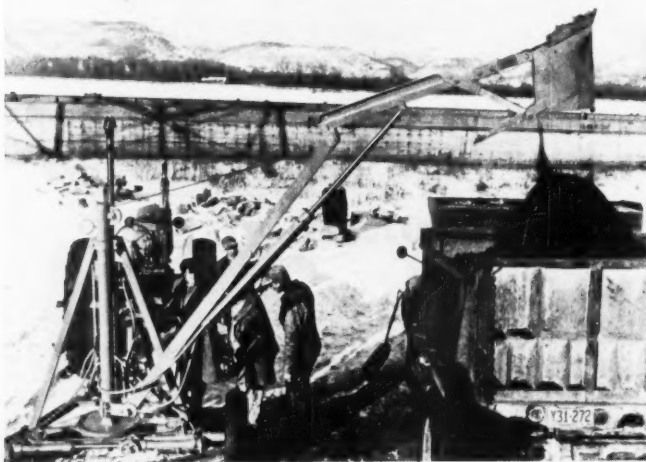


## Hydraulic Conveyor on Big Trencher Operates Independently of Digging Wheel and Drive Tracks

Feature of large-size ditcher is a hydraulically driven conveyor belt that operates independently of the digging wheel and the drive tracks. Thus, when it is necessary to back up (reverse the tracks), the con-

veyor belt does not reverse, and no material is carried back to the digging wheel. In case of cave-ins, the wheel and tracks can be stopped, permitting the conveyor to clear itself. Or, the wheel and conveyor

can be operated independently of the tracks. The Big Incher digs a trench 9 ft deep and up to 52 in. in width. A smaller model (Middle Incher) is contemplated.—Unit Rig & Equipment Co., Tulsa 3, Okla.



## TRAILER-TYPE DIGGER; SHOVEL

—Hopto digger-shovel features 180-deg swing and a wide variety of shovel equipment. Hopto attaches to power take-off of any tractor, Jeep, or truck, with unit supplying power acting as a counterweight. Swing, boom, and dipper stick are hydraulically controlled. Buckets in widths

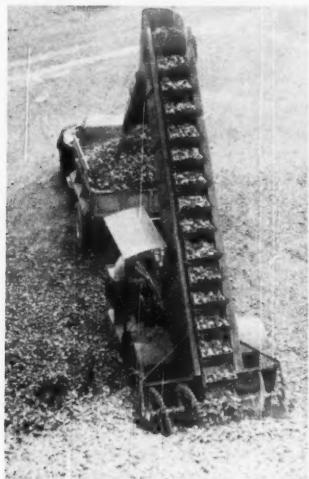
from 14 to 24 in. are available in three types—enclosed back-hoe for free-flowing materials; skeleton type for sticky soils; and shovel bucket for loading, handling, and bank work. Shovel may be raised 14 ft above ground level. Without extensions, Hopto digs to 9-ft depths.—Badger Machine Co., Winona, Minn.



## SCOOP HAS DOZER BLADE—

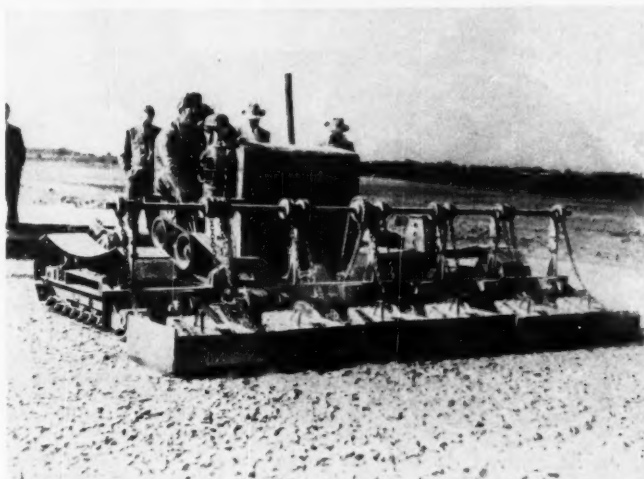
Wagnermobile Duo-Way Scoop has a hydraulically controlled track and an 84-in. dozer blade. It serves as loader, dozer, truck, or tractor. Top section folds to 9 ft 6 in. for low road clearance.—Mixermobile Manufacturers, 8027 NE Killingsworth, Portland 20, Ore.

## New Machinery, Tools and Equipment That Will Help You on the Job



### HEAVY-DUTY BUCKET LOADER

—Model P-11 (wheel mounted) and Model Q-11 (crawler mounted) loaders have a rated loading capacity of 3 to 4 yd per min, with materials weighing up to 150 lb per ft. Both machines handle materials up to 3-in. cube.—N. P. Nelson Iron Works, Inc., Clifton, N. J.



### SUBGRADE TAMPING MACHINE

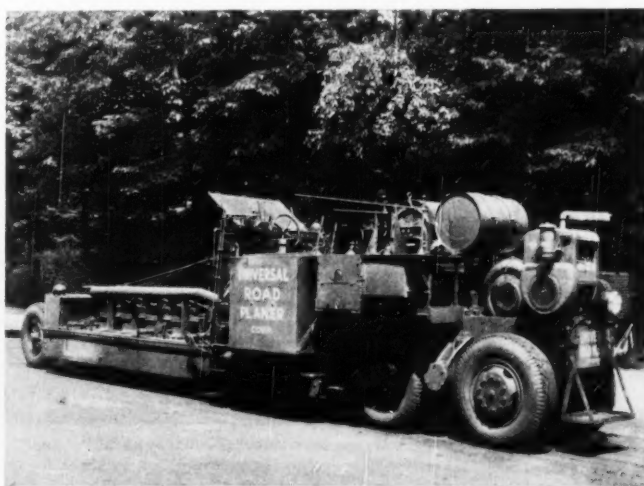
—Vibro-Tamper machine is recommended for compacting and tamping all types of granular soils in advance of the roller. It is designed to nest and shake to repose any small particles in the base material. The Vibro-Tamper has six vibrating shoes. Each shoe has a base measuring

26x18 in. The machine has four speeds in either direction, and is within highway measure limits. Weight of the machine is 8,000 lb. (Photo shows Vibro-Tamper on construction of Marion (Ohio) Municipal Airport). The International Vibration Co., 16702 Waterloo Road, Cleveland 10, Ohio.



### SLINGS OF WOVEN WIRE

Expanded line of woven wire slings is available in standard widths of 3 to 20 in. and in lengths from 36 to 132 in. They are fabricated of wire mesh produced from any metal or alloy. Handles permit use of choke or basket hitch.—Cambridge Wire Cloth Co., Cambridge, Md.

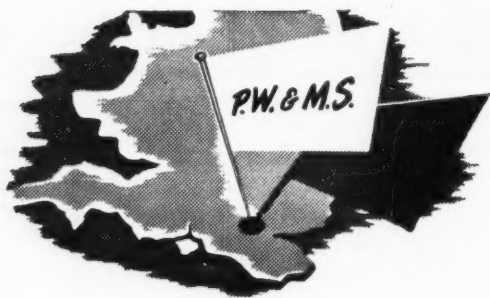


### BITUMINOUS HEATER-PLANNER

Oil-burning rig heats and cuts, to uniform surface, all bituminous pavements. This is accomplished by heating and planing in one operation, and windrowing the planed-off material. Heating hood is 50 in. wide by 100 in. long, and is equipped with eight oil burners. Adjustments are

provided to angle the cutting blades for crown or shoulder key cutting. Working speeds range from 16 fpm, up. Over-all length of the Heater Planer is 35 ft 5 in. Weight is 14 tons. Front and rear tires have same tread to permit cutting close to curb.—Universal Road Planer Corp., 83 S. High St., Columbus 15, Ohio.





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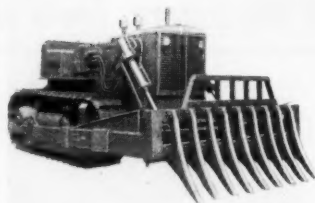
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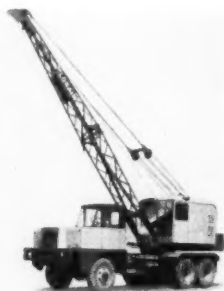
# ELLICOTT

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1605 Bush St., Baltimore 30, Md.



**ROOT RIPPER**—Companion piece to Baker line of bulldozers and Gradebuilders is designed for general land-clearing operations. It may be purchased as an interchangeable attachment for cable and hydraulic units, or as a complete machine. The attachment consists of nine teeth bottled to horizontal cross-members. The teeth are curved to produce a rolling action so that dirt is shaken loose and filtered between the teeth.  
—Baker Mfg. Co., Springfield, Ill.

**DUAL-FUEL ENGINE**—Heavy-duty engines, power units, and generator sets burn either natural gas or diesel fuel. Operation on either fuel is determined by positioning a simple lever. Feature of the Murphy engine is that it employs high-compression combustion. Three models are now available ranging from 135 to 180 hp.  
—Murphy Diesel Co., 5339 W. Burnham St. Milwaukee 14, Wis.

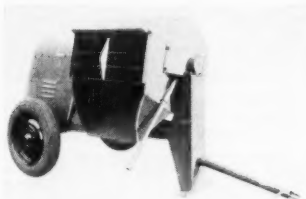


**CRANE HAS 25-TON CAPACITY**—Rubber-tired Thew-Lorain machines, rated at 25-ton lifting capacity on outriggers at 10-ft radius, are available in two models. Both the MC-504 and MC-504W Moto-Cranes were developed by modifying the Lorain-50 Series turntable and mounting it on heavy-duty rubber-tired carriers. Turntable is powered by a gasoline engine. Power is delivered through a Twin Disc hydraulic coupling power take-off. Attachments available are: Crane boom in 100-ft length; 3-sheave boom head which permits reeving six parts of hoist line without top block; lifting crane; shovel booms in 21- or 19-ft length; clamshells; draglines; and hoses.—The Thew Shovel Co., Lorain, Ohio.



#### HAND-SIZE HYDRAULIC CUTTER

—Small-size hydraulic cutter handles reinforcing rod, stainless steel, and Monel rod of 3/4-in. dia, mild-steel rod of 1-in. dia, 1-in. soft chain, and 3/4-in. hard chain. Cutting unit of the Manco Guillotine Model 20-D has an open C-frame anvil that will accommodate hex-shaped and square material. Air-hydraulic pump is operated by any source of compressed air supplying 100-lb pressure.—Manco Mfg. Co., Bradley, Ill.



#### PLASTER AND MORTAR MIXER

—Simple operation and numerous safety features are claimed for the new Blue Brute 6-ft plaster and mortar mixer. Protective grill over mixer is equipped with a bag cutter. Bag platform is built on a 20-deg angle to allow contents to enter bowl without spillage. Six adjustable, wide, high-carbon-steel blades and four stationary blades provide fast and thorough mixing action. Extra-wide blades, set close to drum shell, clean the drum on every revolution of the paddle shaft. Bowl lock prevents accidental dumping.—Ransome Construction Equipment Division, Worthington Pump & Machinery Corp., Dunellen, N. J.

**HAND-SIGHTING LEVEL.**—For accurate alignment when laying drains and foundations, contour grading, and similar leveling operations, a precision-built low-cost hand-sighting level is now available. Made of brass, the complete level is 5 in. in length.—Binoscope Co., National Distributor, P. O. Box 9384, Philadelphia 39, Pa.

## Ramset Fastening System

Cost comparison sheet for *General Contractors Inc.*

This form is provided for estimating costs on any job with RAMSET FASTENING SYSTEM as compared with present method, and to indicate possible savings with RAMSET. In estimating fastening time with present system, use actual time of workmen doing the work, including making fastener hole, inserting plug and attaching fastener. Use same method for RAMSET, which will naturally be less because the fastener itself is set in one operation. Materials cost for present method should include plugs and fasteners, and for RAMSET should include both fastening charge and the fastener itself.

|  | Estimated Present Method | Actual Ramset System |
|--|--------------------------|----------------------|
| NO. OF FASTENINGS                      | 7186                     | 4843                 |
| TIME REQUIRED                          | 2371.4 HOURS             | 968.60               |
| COST AT \$ 2.00 PER HOUR               | \$ 4,742.80              | \$ 1,937.20          |
| COST OF MATERIALS                      | 718.60                   | 2,620.28             |
| TOTAL COST                             | \$ 5,461.40              | \$ 2,841.12          |
| COST SAVED WITH RAMSET SYSTEM          |                          | 52 %                 |
| SAVED PER FASTENING WITH RAMSET SYSTEM |                          | 39                   |
| TIME SAVED WITH RAMSET SYSTEM          |                          | 1,887.1 HOURS        |
|  |                          | 79.5 %               |

**\$2,841.00 SAVED**  
WITH **Ramset** FASTENING SYSTEM

FOUR MINUTES per fastening (total time on job) with RAMSET SYSTEM instead of NINETEEN MINUTES with his old method saved this contractor \$2,841.00 on one steel fastening job. Instead of slow, laborious, costly drilling—just load the self-powered, light, RAMSET FASTENING TOOL. Then—READY! RAM! SET! Quick, easy, economical—and tight. Actual fastening time, less than one minute per fastener!

Compare your fastening costs into steel, concrete and other hard materials. See how much time and money you can save with the simple, lightning-fast RAMSET SYSTEM. With 65 sizes and types of drive pins and threaded studs, you can do almost any kind of construction fastening job.

Your local RAMSET Specialist will help you cut costs and show you how to "RAMSET" your way into more profitable business. Write or wire us collect for name of nearest representative.

#### Ramset System

SAVES TIME . . . CUTS COST

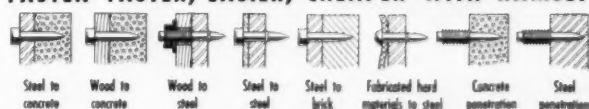
ON JOBS LIKE THESE:

Fastening—

- Wood sills to concrete foundations or walls.
- Wood nailing strips.
- Wire mesh for gunite.
- Metal or composition roofs or walls.
- Wiring, and other electrical installations.
- Framework, brackets and supports to concrete or steel.

Stemco Corporation • Cleveland 16, Ohio

#### FASTEN FASTER, EASIER, CHEAPER WITH RAMSET



# BUILT TO OUTPERFORM

## The Power Graders That Have Everything



"88-H"—a new model of medium size with all the extra traction and maneuverability of All-Wheel Drive and All-Wheel Steer.



"99-H"—popular with contractors and highway departments for its all around performance, under all conditions, in all seasons.



MASTER "99"—combining the best features of the "99-H" with the extra power, traction and road speed of its 100 horsepower engine.

## Crushing, Screening and Washing Plants PORTABLE... STATIONARY



The AUSTIN-WESTERN LINE includes Jaw Crushers and Roll Crushers in a wide range of sizes; plus matching screens, elevators, conveyors and bins. Exclusive features increase output, and reduce maintenance costs.

Skilled engineering characterizes each and every Austin-Western crushing, screening and washing plant, which is tailor-made for a particular production problem. We would welcome the opportunity to discuss yours.

### Model "40" Sweeper



Fast, maneuverable and economical. Dirt is thrown directly into the 2-yard hopper. Right-hand or left-hand gutter broom, or both.

### Road Rollers

3-WHEELED... TANDEM



3-WHEELED ROLLERS with hydraulic scarifiers. TANDEM ROLLERS of the variable weight type. All with gas or diesel engines.

### Badger

Convertible Shovel



The 24-swing Badger wastes no power swinging extra weight; makes more swings per hour; can work in closer quarters.

Advanced engineering and honest construction characterizes each Austin-Western product. Your nearby A-W distributor will gladly recommend the one best suited to your needs.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.

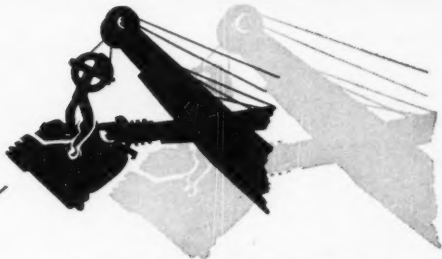
BUILDERS OF

ROAD MACHINERY

# Austin Western

SINCE

1859



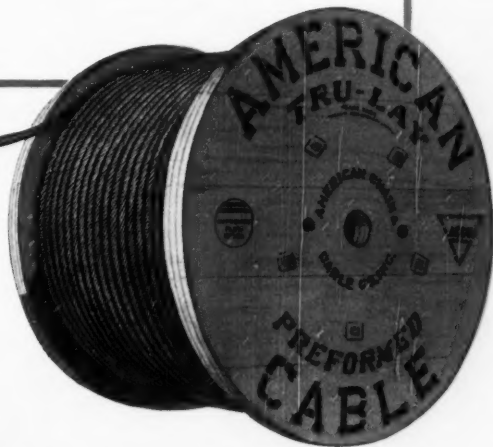
*Just as some shovels  
last longer than others...*

**TRU-LAY...**

*will give you more of everything  
you want from **wire rope***

● TRU-LAY WIRE ROPE is preformed and made by the men who originated preforming. In its toughness and strength are properly combined to give better and longer service regardless of job conditions. Users like its easier handling qualities and the fact that it is available in all constructions, lays, centers and grades.

Specify TRU-LAY—the wire rope that's engineered to cut costs and improve production—and get the most of everything you want from wire rope.



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*In Business for Your Safety*



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AMERICAN CABLE DIVISION**

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York,  
Philadelphia, Pittsburgh, Portland, San Francisco, Seattle, Tacoma, Bridgeport, Conn.





The  
**LIQUID  
LIFTER**  
for speedy and efficient  
hand-pumping

The new LIQUID LIFTER is a low-cost, hand-operated barrel-type pump. It is a light-weight, portable, compact unit, built to meet the general requirements of factories and all-around applications of farms, refineries, petroleum depots, railroads, chemical plants, aviation and marine docks, and outdoor construction machinery. May be used with light or heavy liquids such as oil, gasoline, kerosene, and toluene—has a capacity of 10 gallons per 120 revolutions. Write for folder giving detailed specifications.

**LEAR-ROMEC**  
A division of Lear, Inc. at Elyria, Ohio



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- Last longer
- Lubricate better
- Reduce downtime
- Cut parts bills



**D-A LUBRICANT COMPANY, INC.**  
INDIANAPOLIS 23 INDIANA

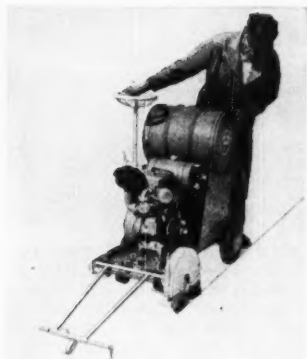


**TRACTOR-DRAWN SCRAPER**—The Model TC-170 tractor-drawn scraper has a 17-yd struck (20-yd heaped) capacity. New curved ejector and 65-in. apron opening have been engineered for faster discharge of all types of loads. Three-piece cutting edge, rear-draft fulcrum leverage, and boiling bowl loading are said to increase loading speed. Ground clearance has been increased, and re-engineered cable arrangement is said to add to stability, ease of control, and cable life.—**Wooldridge Mfg. Co., Sunnyvale, Calif.**

**ALL-METAL SLIDE RULE**—New 5-in. log log slide rule contains 22 scales. Features of the 600 model include: Back-to-back scale arrangement brings related scales together to give the appearance of a simple 10-scale rule; combination of C and D scales on both sides, added to full complement of inverted scales, gives the rule the same power, speed, and convenience of a 10-in. rule; and all-metal-body construction with needle-sharp graduations.—**Pickett & Eckel, Inc., 5 S. Wabash Ave., Chicago 3, Ill.**



**COMBINATION CRANE, PILE DRIVER**—Self-contained, revolving locomotive-type unit is a combination crane and pile driver. One unit, one power plant, and one crew perform the entire job of driving piles and setting caps and trusses at one spotting. Specifications and capacities are flexible for individual requirements.—**Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago 5, Ill.**



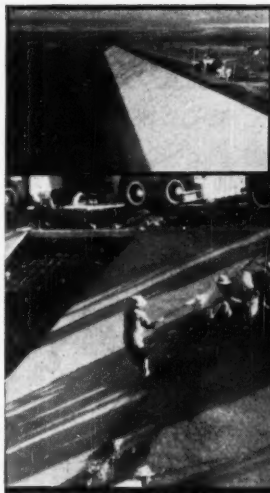
#### LIGHT-DUTY CONCRETE CUTTER

—Standard model Di-Met concrete cutter handles practically all ordinary concrete-cutting requirements. It uses a 12-in. (maximum) Di-Met diamond wheel on either right or left end of the spindle. The 12-in. blade cuts to a depth of 3½ in. Two coolant provisions have been made—water may be supplied from mains or tank trucks; or from a built-in 15-gal tank. Power is provided by a 7.5-hp Wisconsin engine.—Felker Mfg. Co., Torrance, Calif.

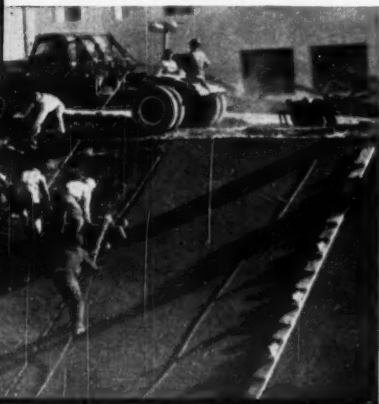


**MULTI-BLADE MIXER**—Portable multi-blade mixer is powered by electric motor or gasoline or diesel engine. Height of discharge door is located for use with standard wheel barrows. Mixer is mounted on truck provided with four pneumatic-tired automobile wheels. The Multico mixer is produced in 3-, 5-, 7-, and 12-ft capacities.—Multiplex Machinery Corp., Elmore, Ohio.

**PORTABLE TRUCK SCALE**—Removal of six nuts which hold side arms in place permits transporting the Thurman scale on flat-bed truck. It is quickly re-assembled on the job. Scales can be furnished with full-capacity weighbeam or weighbeam having net and tare bars. They have extra-wide heavy steel bases at either end which support the scale; eliminating the need for pouring footings and foundations. The Thurman scales are made in 18-, 20-, 25-, and 30-ton capacities; and in 18-, 22-, and 30-ft platform lengths.—Thurman Machine Co., Scale Division, 156 N. 5th St., Columbus, Ohio.



Templeton Gap Spillway, Colorado Springs, Colo. Angle 45°, Concrete slump ¾". Extra men on screed for weight only.



## JACKSON ELECTRIC VIBRATORY SCREED

MOST VERSATILE CONCRETE SCREED AVAILABLE

GREATEST PRODUCER  
OF QUALITY  
WORK ON:

SPILLWAYS

•

BRIDGE DECKS

•

MUNICIPAL PAVING

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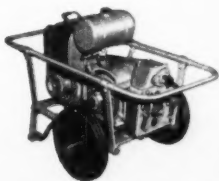
HIGHWAY PATCHING  
and WIDENING

•

AND MANY OTHER  
USES

Powered by a thoroughly reliable Jackson 1.25 KVA Portable Power Plant, this manually guided screed will place perfectly upwards of 65 cu. yds. of stiff mix concrete per hour; will undercut at side forms and curbs; strike off to crown (regular or inverted); work right up to and around sewers, manholes and other obstructions. Has strong tendency to propel itself and operators can easily and quickly roll it back for second passes **without bearing the weight of the screed**. Operators work from front, rear or side of machine. Quickly adaptable to any slab width from 6' up to any practical width. You're missing a tremendous time-and-money-saver if you are not familiar with the Jackson Screed. Write for details or see it at your Jackson distributor.

Model M-1 Power Plant — operates the screed. Generates both single and 3-phase 40 cycle, 115 volt AC. Equipped with generator requiring no maintenance or adjustment. May also be used for lights or operating tools. Other plants of 2.5 and 5 KVA capacities.



**OTHER MONEY-MAKING VIBRATORY EQUIPMENT** for all types of concrete construction from thin sections to mass construction, highway and airport paving. **FOR SALE OR RENT** at your Jackson Distributor. Write for handy Jackson "Pocket Guide" to the complete line.

**ELECTRIC TAMPER & EQUIPMENT CO. Ludington, Mich.**

# Every Dirtmover needs a BANTAM



## Here's Why!

- Drives anywhere, any time at 35 m.p.h.
- Goes into tight spots where big rigs stop.
- Digs up to 100' of 5' trench per hr.
- Cuts straight, vertical walls without hand trim.
- Excavates to 14' depth, levels bottom — turns neat, square corners.

## SAVES MONEY on production jobs MAKES MONEY on scattered jobs

Join the hundreds of large and small contractors, highway departments, etc., who are cutting costs on ALL kinds of jobs with Schield Bantam Trench Hoes. Ideal for ditching . . . installing culverts . . . sewer and water lines . . . stock ponds . . . basements, etc. Gives you high output with low investment. Only \$5290 for basic trench hoe, less truck . . . or factory can supply suitable truck for \$1350 to \$1850 plus small mounting charge.\* Remember, too, hoe interchanges with shovel, clamshell, dragline, pile driver and 10,000 lb. crane — for year 'round earnings. **ACT NOW!**

\*Prices F.O.B. Waverly, Ia. Subject to change without notice

## TEAR OFF and MAIL THIS HANDY COUPON NOW!

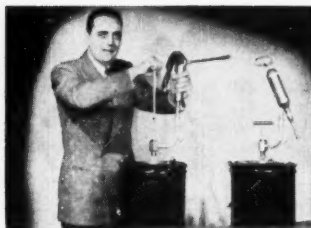
SCHIELD BANTAM CO.  
221 Park St., Waverly, Iowa

Rush full details on new Schield  
Bantam with attachments checked

- ☐ Trench Hoe
- ☐ Shovel
- ☐ Crane
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- ☐ Clamshell
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Name \_\_\_\_\_  
Occupation or Business \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

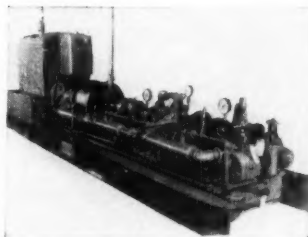
**SCHIELD BANTAM**  
The **THRIFTY** machine with the **BIG** earning range



**PORTABLE LUBRICATOR**—One-hand-operated greasing outfits are available in two models. The Dyn-O-Luber (Model 7185-A) features the Dyn-O-Mite gun. This gun weighs 2 lb. and holds enough lubricant to grease up to 55 bearings. The Dyn-O-Pistol (Model 7185-B) has a gun with a 9-oz capacity. Loading pump is mounted in a rigid steel cover which fits the top of any standard 25- or 35-lb lubricant container. A few strokes of the pump handle fills the gun. The gun is then uncoupled and is ready for use.—**Alemite Div., Stewart-Warner Corp., Dept. F, 1850 Diversey Parkway, Chicago 14, Ill.**

## ENTRAINING AGENT DISPENSER

—Automatic dispenser for liquid air-entraining agents passes the liquid through a bag which is alternately opened and closed at top and bottom. The Techkote Mach unit release can be actuated by hand, or by mechanical means in connection with the water discharge to the concrete mix. Quantity discharged can be easily set from 3 to 40 oz. Features include the elimination of: Internal moving parts, air vents, pistons, and packing glands or nuts.—**Techkote Co., Inglewood, Calif.**



## ON - THE - JOB - EMULSIFIERS—

Portable units are designed for making asphalt emulsions on the job, or at central stationary installations. Production capacities range from 500 to 6,000 gph of emulsion. Plants are supplied complete with emulsion mill, asphalt and water-proportioning units, water-treating unit, supply and discharge pumps, asphalt barrel heater, storage tanks, and diesel, gasoline, electric, or belt drive. Units can be supplied on tired-trailer mountings, skid types for use on motor trucks, and as permanent installations.—**K. E. McConaughay, Painters & Decorators Bldg., Lafayette, Ind.**

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**STRENGTHENS THE BUCKET... USES NO BOLTS**

This change-over standardizes your stock order to just one type of points for all equipment.

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**50¢**  
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**STOCK ON HAND... SEE YOUR DEALER  
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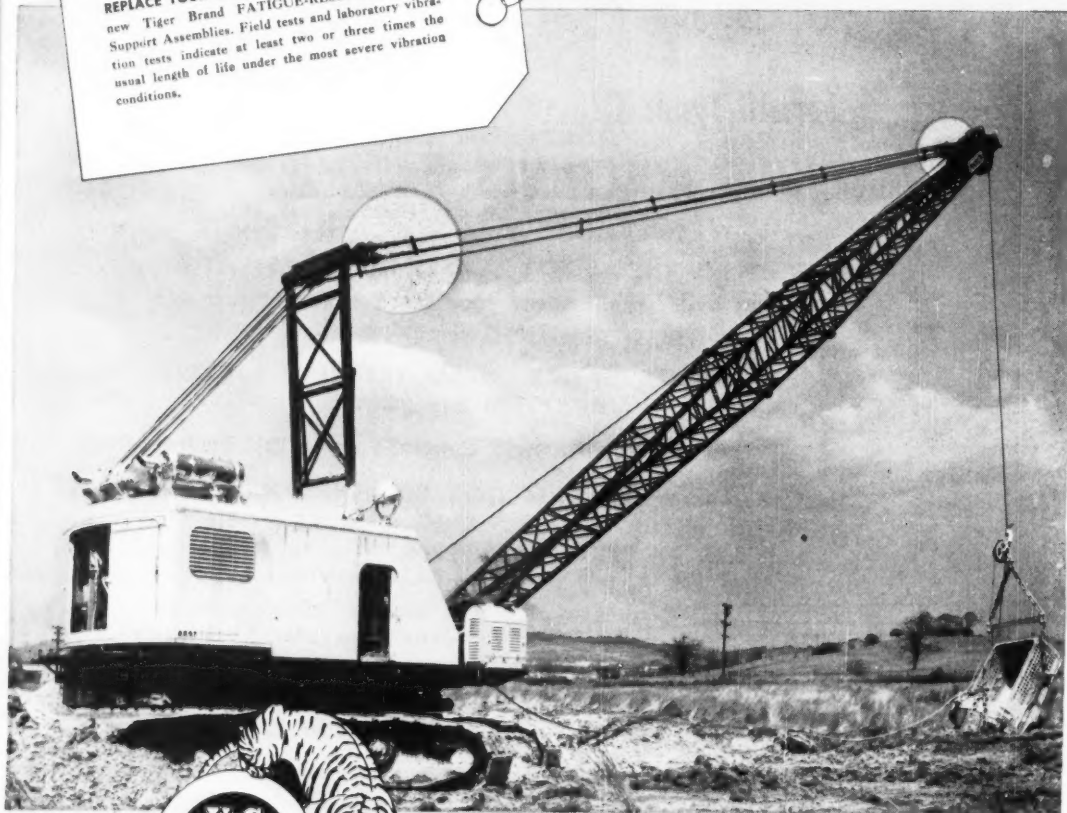
# 2 to 3 times longer

## with these new Fatigue-Resistant



An exclusive development of  
**AMERICAN STEEL & WIRE COMPANY**

REPLACE YOUR OLD BOOM SUPPORTS with these new Tiger Brand FATIGUE-RESISTANT Boom Support Assemblies. Field tests and laboratory vibration tests indicate at least two or three times the usual length of life under the most severe vibration conditions.



NEW TIGER BRAND FATIGUE-RESISTANT BOOM SUPPORT ASSEMBLIES on a 5 cu. yd. dragline near Pittsburgh, Pa.

# life for boom supports

## Tiger Brand Cable Assemblies

● Here is an "innovation" in boom support assemblies that effectively combats the most severe vibration on power shovels, draglines and cranes. Notice the novel thimble design which embodies an interwoven eye and open end pendant easily and quickly interchangeable on standard equipment.

This new design dampens vibration instead of concentrating it at one point. The result is two to three times longer life for boom supports and much greater safety.

The new boom supports are especially adaptable to installations where fatigue failures occur adjacent to sockets. They can be easily and quickly adapted to your present equipment because essential dimensions such as pin diameters, distances between ears, etc., are the same as for standard open and closed sockets.

Fatigue-Resistant Boom Supports are an exclusive development of American Steel & Wire Company. Send the coupon for complete information.

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COLUMBIA STEEL COMPANY, SAN FRANCISCO  
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SOUTHERN DISTRIBUTORS  
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



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Rockefeller Building, Dept. B-70  
Cleveland 13, Ohio

Please send me complete information on your new Tiger Brand Boom Support Assemblies.

Name.....

Title.....

Company.....

Address.....

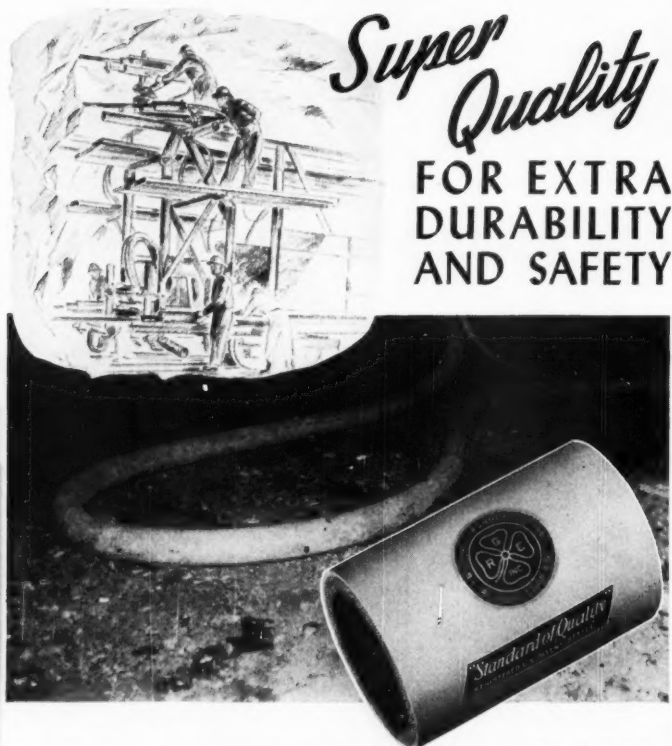
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### AMERICAN TIGER BRAND WIRE ROPE

*Excellay Preformed*

UNITED STATES STEEL



*Super  
Quality*  
**FOR EXTRA  
DURABILITY  
AND SAFETY**

## **"ALLGOOD CORD" AIR HOSE**

Goodall's finest large-size air hose, designed especially for jumbos, caissons and other heavy-duty service where reliability and safety are of first importance. Built to stay on the job longer by resisting continuous abrasive wear and damage caused by falling rock, tools, timbers. Made kinkproof to assure a steady flow of air. Available in 1½" to 4" sizes, in maximum lengths of 50 feet.

A Goodall "Standard of Quality" product, backed by years of outstanding performance in tunnel, bridge, dam and other heavy construction.

Contact Our Nearest Branch for Details and Prices



**GOODALL RUBBER COMPANY**

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

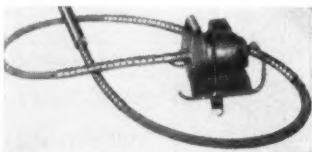
Branches: Philadelphia • New York • Boston • Pittsburgh • Chicago • Detroit • St. Paul • Los Angeles  
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Est. 1870

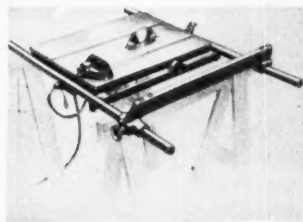


**ADJUSTABLE STEEL FORM CLAMP**—Comprised of stake and cross-piece, the Bolt clamp can be used for setting up wood forms for building foundations. It is adjustable for widths from 4 to 8 in.; for heights to 24 in.; and for batter from vertical to any angle. Standard steel stakes are used, and are said to prevent kicking out of forms at bottom. No special spreaders or wall ties are required. No tools are required to adjust clamps as a locking lever is part of each clamp. An adjustable crossbar can be used with the regular stakes to set up any building foundation up to 36 in. in height and to 10 in. in width.—**Pacific Engineering Sales Co.**, 215 W. 5th St., Los Angeles 13, Calif.

**BLASTING GALVANOMETER**—Adjustable blasting galvanometer is said to provide accurate resistance readings in ohms even when its activating cell is not at full strength. Several features are designed for extra safety and control in testing blasting circuits before firing. The Atlas No. 4 galvanometer is calibrated to an accuracy of less than ½-ohm resistance. It can be used to check small resistances, such as a single blasting cap, and may be used as an ammeter in detection of stray currents, especially useful in underground blasting work.—**Atlas Powder Co.**, Wilmington, Del.



**ELECTRIC VIBRATOR** — Light-weight electric vibrator is equipped with a flexible shaft and sealed-in-oil vibrator head. The motor, which delivers up to 9,500 rpm, is protected by special skid-mounting. Double handles simplify lifting in either the horizontal or vertical position.—**Stow Mfg Co.**, Binghamton, N. Y.



**TILTING-ARBOR SAW TABLE**—Lightweight saw table (44 lb) is easily carried in one hand. Model 5500 tilting-arbor saw table increases utility of the Speedmatic portable saws. The table can be mounted on saw horses or on 32-in. steel legs available as an accessory. The 26x20-in. table, with 45-in. front and rear rails, provides a maximum ripping capacity of 24½ in.—Porter-Cable Machine Co., 2504 N. Salina St., Syracuse 8, N. Y.

**ALL-PURPOSE LUBRICANT**—Plastilube all-purpose lubricant is said to have no melting point. In addition to non-melting feature, Plastilube possesses high adhesive qualities, excellent pumpability at low temperatures, and high stability.—The Warren Refining & Chemical Co., 750 Prospect Ave., Cleveland 15, Ohio.

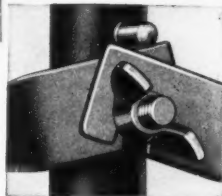


**SMALL MODEL GRAVELMASTER**—Junior B is the smallest unit in the 880 Gravelmaster series of crushing, screening, and loading plants. Over-all height has been lowered and screening area increased with a 2x8-ft 2½-deck screen. Provision is made for removal of chips. A 10x16-in. roller-bearing jaw crusher and an 18x16-in. star-gear roll crusher are used in the Junior B. Power unit is mounted on the plant. Plant may be fed by shovel-loading hopper, or by a swivel feed conveyor. The Junior B meets road limitations.—Universal Engineering Corp., Div. Pettibone Mulliken Corp., Cedar Rapids, Iowa.

**FUEL-PUMP CALIBRATING STAND**—Repairs and adjustments of diesel-fuel injection pumps are speeded by the Model AP 3200 calibrating stand. Adjustable to all makes of pumps, the stand is a self-contained unit for calibrating, testing, and adjusting fuel pumps.—Automotive Products, Inc., 1700 S. E. Grand Ave., Portland 14, Ore.



Get up in the world faster with this  
**BRACE LOCK** exclusive with  
**BIL-JAX SCAFFOLDING**



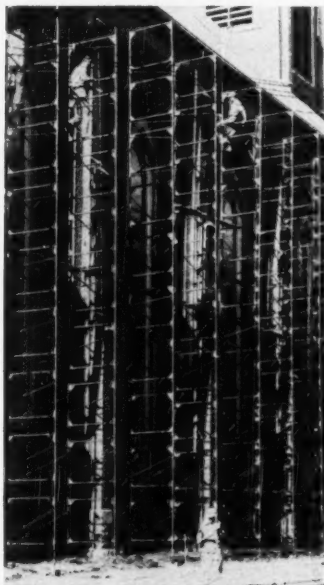
Braces are easily attached and removed  
**WITHOUT REMOVING WING NUTS**

Now . . . Bil-Jax takes only a fraction of the time needed to erect or dismantle ordinary steel scaffolding. Cross braces attach to end frames by merely placing slotted ends onto studs, then tightening wing nuts. Braces are removed by simply loosening wing nuts a few turns. It is never necessary to completely remove wing nuts, and no tools are required.

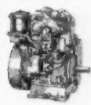


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sale and rental plans.

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## Why WISCONSIN ENGINES



are Air-Cooled

Air-Cooling, as developed and perfected by Wisconsin Motor Corporation engineers, has these important advantages for the power user:

1. Greatest freedom from cooling chores and troubles. More Service FROM the engine, less service TO the engine; fewer Man-Hours lost; more H.P. Hours on the job.
2. Most efficient cooling at all engine speeds and all temperatures, from sub-zero to tropical highs. The engine never runs out of AIR!
3. Lowest maintenance cost. Integrally cast flywheel fan eliminates all cooling "accessories" . . . nothing to get out of order, wear out, or require replacement.
4. Lighter engine weight and greater compactness . . . for most convenient portability and greatest installation adaptability as power components on original equipment.

Every Wisconsin Engine from the smallest to the largest (3 to 30 hp., single cylinder, 2-cylinder and 4-cylinder) has all the advantages of dependable AIR-COOLING, plus heavy-duty design and construction throughout.



**WISCONSIN MOTOR CORPORATION**

World's Largest Builders of Heavy-Duty Air Cooled Engines

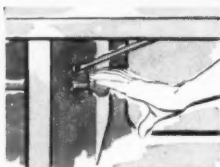
MILWAUKEE 46 WISCONSIN





# CHAMPION

## *the NEW*



**Positive all-weather starting** on gasoline, with quick change-over to full diesel operation, all from the seat.



**Instant speed change** up or down one speed, or stop, without declutching. Planet Power drive does it!



**Separate reverse lever** for quick change of direction. The tractor moves in the direction the lever is moved.



**Planet Power steering** puts turns with power on both tracks, feathered turns and pivot turns at your fingertips.

### HERE ARE SOME OF THE CHAMPION'S EXCLUSIVE FEATURES

**Self load and run** with scrapers of 17-yard capacity—and shift gears on-the-go with the rolling load.



**Cut waste shifting time** out of work cycles, provide the best speed for every operation, 8 speeds in each direction!



**Work on grades up to 100%.** Its power, ground contact, balance and lubrication are right for licking any grade.



**Handle heaviest loads** on gradual turns as easily as straightaway because both tracks are powered in the turn!



## "There Is Nothing Like The TD-24. It Can Out-Push Any Tractor On The Job."

"Here is the Champion of Crawlers," owners will tell you, "the tractor that will pull down your dirt moving costs."

Contractors and operators who have observed or operated the new International TD-24 diesel crawler are spreading the news. Here is a tractor that out-works and out-performs every other crawler known to the industry!

Operators compete with each other from Florida to Alaska to get "the big red devils," the TD-24's, assigned to them. They'll tell you no other tractor can compare with the TD-24 for ease of operation or work capacity!

# of Crawlers

## INTERNATIONAL TD-24

Comfortable to ride, powerful, fast, safe and economical to operate, the TD-24 is revolutionizing ideas of what crawler tractors can or cannot do on the big jobs.

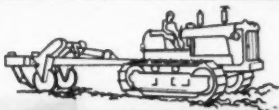
Regardless of what equipment you now use, visit your International Industrial Power Distributor and get a TD-24 demonstration. See for yourself what the TD-24 can mean to your operations in shortened time, reduced costs, extra profits.

INTERNATIONAL HARVESTER COMPANY • Chicago



# INTERNATIONAL INDUSTRIAL POWER

*Tune in "Harvest of Stars" with James Melton, Sundays, N. B. C.*



# Underneath the river



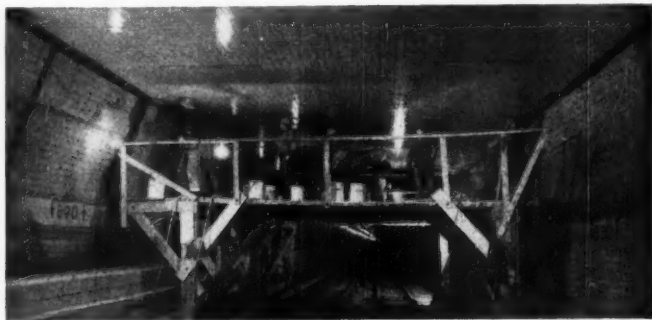
THORITE Patching Mortar Crew at work in Air Tunnel under East River, New York.



Sealing Leaks in Traffic Tunnel with WATERPLUG.



Sealing Drain Pipe Channels in Tunnel with WATERPLUG.



WATERPLUG Crew at work, before placing of tile lining, Battery Tunnels, East River, New York.

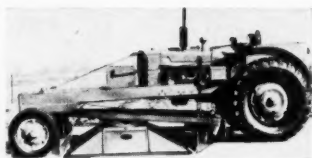
On many of the largest underground projects in the Americas and in foreign countries, WATERPLUG solves, for the contractor, his water problems. The job may be small or it may be large, the results are the same — Successful.

Get our 20-page brochure, pictorially describing, in detail, "How To Do It." It's yours for the asking. — No. 140.



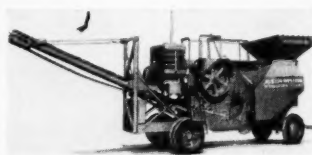
## Standard Dry Wall Products

BOX X, NEW EAGLE, PENNSYLVANIA



**ASPHALT ROAD PLANER**—Clarkmore asphalt road planer is designed for resurfacing and renovation of old asphalt or road pavements. The Model 31 is powered by a gasoline engine. Fuel-oil burner supplies intense heat to the heating hood area. This burner throws a flat or horizontal flame into the heating hood. Depth of cut of planing blades is controlled hydraulically.—**Asphalt Maintenance Co., 41 Park Row, New York 7, N. Y.**

**WALER BRACKET** — Safety and economy are features claimed for the Superior waler bracket. This bracket is equipped with a slot for guard-rail uprights. All joints are welded, and a double hook-and-angle bearer eliminates swaying. A 2x4 extension pad may be slipped into the bottom pocket so that the unit can be attached to the bottom waler.—**Superior Scaffolding Co., 5634 Bankfield Ave., Culver City, Calif.**



**PORTABLE CRUSHING PLANT**—Single-pass-type plant is designed for fast, economical production of crushed rock or gravel where extreme accuracy in grading to size is not required. The Model 61 is especially suited to the maintenance needs of town and county road departments. This lightweight, portable unit features simple design and sturdy construction.—**Austin-Western Co., Aurora, Ill.**

**CONCRETE FORM CLAMP**—Taper-Tye continuous-rod concrete form clamp features: Fast installation and adjustment; easily removed from concrete because of its tapered construction; eliminates twisting and unscrewing of rods imbedded in concrete; does not require reassembly after stripping; eliminates threaded tie rods; and tapered hole is grouted by filing from large end. The Taper-Tye is made in one length which is adjustable for wall widths ranging from 6 to 14 in. By tying standard she bolts on to the end of the rod, it is possible to form up to a 29-in. wall. By tying two tapered rods together with a coupling, it is possible to form walls up to 46 in. thick.—**H. J. Krueper Co., 535 S. Clarence St., Los Angeles 33, Calif.**



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ALEMITE PORTABLE SERVICE STATIONS**

Now sectionalized to give you just the greasing rig you want, these new Alemite units allow whatever choice of chassis pumps, gear-oil pumps, reels and hand-meters you require. Alemite combines them into platform units that can be put together into one, portable outfit for on-the-job lubrication of your trucks and equipment.

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Any Portable Service Station you need can be easily assembled from these new, *sectionalized* Alemite units.

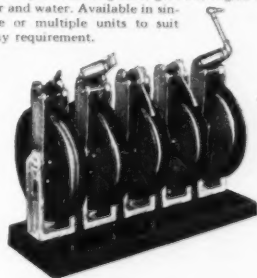
Other heavy duty pumps, reels and accessories are also available for 400-lb. and 54-gal. capacity drums.

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**Alemite Pumps,**  
air-operated, for deliver-  
ing chassis grease and gear oil from 100-lb.  
drums. Available for individual or "group"  
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delivery of chassis grease, gear oil, engine oil,  
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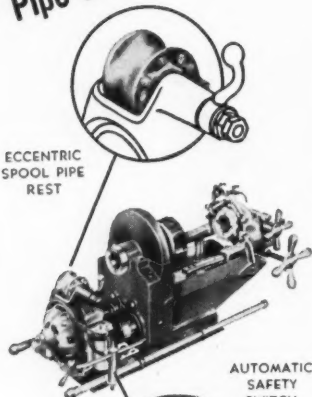
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*Now Better than Ever*  
**BEAVER**  
**Model-A**  
 Pipe and Bolt Machine

ECENTRIC  
SPOOL PIPE  
REST



AUTOMATIC  
SAFETY  
SWITCH

*Safe! Smoother!*

Two new improvements—patents pending—have been added to further increase the safety, convenience and performance of the Beaver Model-A  $\frac{1}{2}$  to 2" Pipe & Bolt Machine—popular the world over for the past 19 years.

1. The new Automatic Switch Lock and Chuck Wrench holder makes it impossible to start the machine without removing the chuck wrench. This protects both workmen from injury and machine from damage. A highly important Safety Feature.
2. The new Eccentric Spool Pipe Centering Device is detached from the rotating spindle—prevents the whip of long revolving lengths of pipe from rocking the spindle and causing flat-sided, leaky threads.

And don't forget—there are 132 different kinds and sizes of dies available, in stock, for your every requirement when you buy a Beaver Model-A. This die inventory represents an investment of more than \$150,000—to insure immediate user service. Sold by leading jobbers—

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 PIPE TOOLS

**STAKES FOR CONCRETE FORMS**

—Saber stakes are made from 1½-in. round steel and are 48 in. in length. The forged steel point permits driving them into rock, hard frozen ground, macadam, or black-top paving. A special feature is the 2x4 carrier located near the top. This carrier has a hole in the handle so that 2x4's can be spiked into a firm, solid position.—Rockford Bolt & Steel Co., Rockford, Ill.



**CENTER-DUMP SEMI-TRAILER—**

Features of new model center-dump semi-trailer include low cost, light weight, compliance with bridge and axle laws, and wide range of applications. Adjustable latch mechanism allows pre-setting dump-door opening from 4 to 36 in. Hopper bottoms are especially designed for efficient handling of materials specified by the purchaser. Main frame members pass outside hopper, leaving it clear of obstructions and interior bracing.—Omaha Standard Co., Council Bluffs, Iowa.

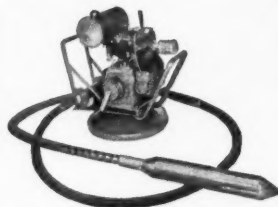
**CURVED JAW-CRUSHER PLATE—**

By using a curved surface, the Traylor jaw-crusher plate is said to cut power costs, reduce percentage of waste fines, and to produce a more uniform, cubical aggregate. These plates are also said to eliminate crusher packing and choking, and to allow free fall of material as it progresses through the crushing chamber. This is accomplished by providing each succeeding zone in the crushing chamber with a greater capacity than the preceding zone.—Traylor Engineering & Mfg. Co., 149 Mill St., Allentown, Pa.



**PNEUMATIC - TIRED ROLLERS—**

Water-ballast bodies on BMCO pneumatic-tired rollers are equipped with large filler plates and plugs in the top of the body. Cleanout plates on the bottom permit ballasting with water or water and sand. The cleanout plates are sufficiently large to allow for quick and easy flushing out of sand. Independent wheel action is a feature of the roller.—Lewis-Browning Mfg. Co., 111 Humble Ave., San Antonio 6, Tex.



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Gasoline Engine or  
Electric Motor Driven

**CONCRETE GRINDERS**

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**BULLDOZER BLADES  
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#### PORTABLE ASPHALT PLANT—

Continuous-process central-mix asphalt plant has a rated capacity of 50 to 72 tons per hr. The model 51 Continuflo consists of two main units and features portability and all-electric drive. No erection work is involved in setting up the plant—units are pulled or backed into place and are ready to go as soon as piping is

attached. Either steam-atomizing or air-atomizing burner is available. The entire plant is electric driven with individual motors for each functioning unit.—**Pioneer Engineering Works, 1515 Central Ave., Minneapolis 13, Minn.**

#### VERTICAL TURBINE PUMP —

Glass-lined bowls and bronze impellers are features of the Watermaster vertical turbine pumps. These pumps are adaptable to deep wells as small as 4-in. dia. Equipped with vertical hollow-shaft electric motors, they deliver 15 to 115 gpm, and under certain conditions, 140 gpm or more. Design features include adjustment

on drive head to change capacity or pressure; closely spaced synthetic rubber bearings; and  $\frac{3}{4}$ -in. stainless steel shafting. An oversize foot valve holds water in column. Valve face is rubber lined and mounted in inclined position to prevent sticking or clogging in presence of sand.—**A. O. Smith Corp., 3533 N. 27th, Milwaukee, Wis.**



**CONCRETE DRILL BITS**—Centerless-design concrete drill bits are available in a range of sizes from 3/16 to 7/16 in. Feature of this drill is elimination of the center point, said to result in faster drilling with less pressure. These drill bits can be used with ordinary electric drills at speeds from 500 to 1,200 rpm. The company offers free resharpener and repair service for the life of all its drills.—**Tilden Tool Mfg. Co., 1995 N. Fair Oaks, Pasadena 3, Calif.**

**FORMED STEEL LINTELS**—Carried as stock items, these formed steel lintels are available in standard sizes in 6-in. multiples. Corrugated for extra strength, the lintels are made from 9- and 11-gage steel. They are supplied with a baked-on prime coat.—**The Steelcraft Mfg. Co., Rossmyre, Ohio.**



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Steel or Aluminum

Costly accident hazards are eliminated with GOLD MEDAL Junior Scaffolds . . . and time and labor saved on many light-duty operations such as stone setting and pointing up masonry.

Galvanized steel rope replaces dangerous block and falls. No ropes to dangle, tangle or obstruct platform.

Mechanism assures positive locking at all times.

Working parts and safety features exposed for inspection and servicing.

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Winch and stirrup for Junior Scaffold. Platform check prevents platform from slipping out of stirrup.

Gold Medal Scaffolds work for thousands of builders. See how they can work for you. WRITE FOR FREE BULLETIN J-6.

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**REVERSIBLE ROOTER POINTS**—Forged rooter point fits all small trenchers. The Model 51 point is  $4\frac{3}{4}$  in. long and has a Rockwell C 48/51 hardness. The point resembles a cape chisel with heavy ribs on each side, providing a strong, shallow cutting face.—**Jiffy Products Co., Inc., 3611 Parry Ave., Dallas, Tex.**

**FIRE-RETARDANT COATING**—Chemical fire retardant is designed for spraying on walls, fiberboard partitions, wood, textiles, and other materials. Heat of a fire on treated article liberates a non-irritating, non-toxic gas which dilutes and cools the products of combustion to below their spontaneous ignition point. At the same time, Flamort produces a glaze and char-like coating at the area contacted by the flame. Tendency to smolder is eliminated. Flamort powder is packed in fiber drums and wooden kegs; solutions are sold in quart and gallon bottles, and in 5-, 10-, 16-, 30-, and 50-gal kegs.—**Flamort Chemical Co., 746 Natoma St., San Francisco 3, Calif.**

# 234 STORIES!

**STARRETT BROTHERS AND EKEN, INC.  
USE AMERICAN HOISTS ON COUNTRY'S  
LARGEST ARCHITECTURAL CONCRETE JOB**

Eighteen X-shaped apartment buildings, each 13 stories high—a total of 234 stories—that's just one part of Parklabrea—the great Los Angeles project of Metropolitan Life Insurance Co.

To pour the oceans of concrete used on the job, the contractors selected 18 American Model 75 General Purpose Hoists and 18 towers for speed, smoothness and economy.

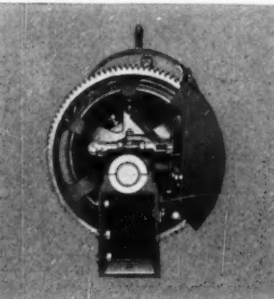
The project is now well on its way to completion. The concrete has moved precisely on schedule . . . and the dependability of American Hoists has again been proved by *performance*.



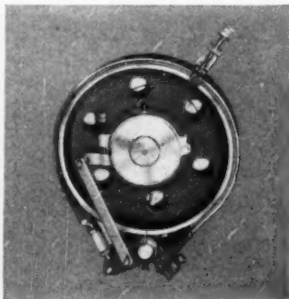
**AMERICAN GENERAL PURPOSE HOISTS**—the biggest-selling line of construction hoists in the world—are used at Parklabrea. Shown here is a Model 75, three drum. Notice winch heads on drum shafts—a standard feature of all American Hoists.



**GENERAL VIEW** of one section of Parklabrea shows the scope of the project. Eighteen American Model 75 General Purpose Hoists will lift 163,000 cubic yards of concrete for the complete job.



**EXTERNAL CLUTCHES**, contracting band type, help make American Hoists safer—smoother—cooler—easier to service.



**AUTOMATIC SAFETY BRAKE**—Brake sets automatically in case of power failure . . . makes accidental dropping of load impossible.

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When road contracts call for a lot of rock work, just be sure you have plenty of Bethlehem Hollow on the job. Then you can just about forget drill steel problems.

Hard-rock men everywhere count on this "old reliable" steel for long service when drilling conditions are really tough. And they know, too, that it's equally suitable for forged-on or detachable bits.

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**BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.**

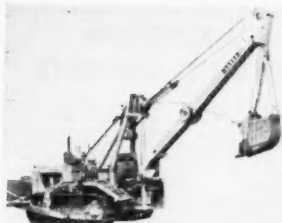
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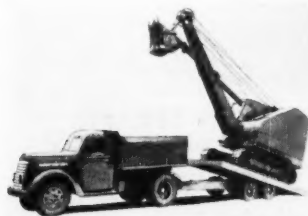


## BETHLEHEM HOLLOW DRILL STEEL



**TRACTOR-MOUNTED EXCAVATOR**—Hyster D6 Hystaway, tractor-mounted  $\frac{1}{2}$ -yd excavator, can now be equipped with a hoe front. Complete tractor mobility and maneuverability are fully retained with the attachment in place. Utility use of dozer blade is maintained. Standard width of hoe dipper is 33 in, but for narrow ditching requirements, a 23-in. dipper is available.—**Hyster Co., 2921 N. E. Clackamas, Portland 8, Ore.**

**HEAVY-DUTY TRUCK DIESELS**—Three new models have been added to the Buda 161 series of heavy-duty truck engines. Model 6DAS-844 Supercharged is rated 280 hp; the Model 6DA-844, 215 hp; and Model 6DA-779, 185 hp. All are 6-cyl diesels with practically the same mounting dimensions. A special feature is the monolobe Dyna-Swirl combustion chamber, said to develop increased horsepower.—**The Buda Co., Harvey, Ill.**



**TANDEM-AXLE TILT TRAILER**—Three new tandem-axle tilting-platform La Crosse semi-trailers are available in capacities of 13, 16, and 20 tons. Unlocking a safety catch automatically tilts the platform. The platform returns to level as equipment is driven on. Two double-acting hydraulic cylinders cushion the 96-in.-wide trailer platform while it is being tilted with or without load.—**La Crosse Trailer Corp., La Crosse, Wis.**

**HYDRAULIC PUMP**—Hand-operated hydraulic pump is now available in small sizes. The Power-Packer, Jr., consists of pump, reservoir, and control valve. Capacities are: Model P-146, for systems with maximum pressures to 6,000 psi; Model P-147, for pressures to 5,000 psi; and Model P-148, for pressures to 2,500 psi.—**Blackhawk Mfg. Co., Milwaukee 1, Wis.**

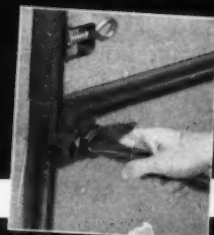
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**NOW — RELIANCE** Construction Equipment offers you important improvements in complete Crushing, Screening, and Washing Plants. Look into the smooth operation and rugged construction of the **RELIANCE LINE**.

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Fairbanks-Morse generators are available in capacities from 600 to 35,000 watts—A.C., D.C., or A.C.-D.C., according to type.

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For complete information about a generator to meet your needs, see your local Fairbanks-Morse dealer, or mail the coupon.



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*a name worth remembering*

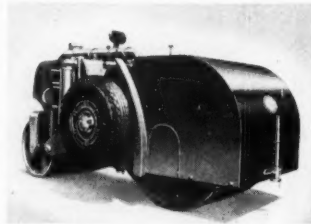
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City \_\_\_\_\_ State \_\_\_\_\_

**RUBBER PINCH VALVE**—Features of this rubber pinch valve include: long wear, flexibility offsets misalignment in pipes, no packing or repacking is required, absorbs vibration, eliminates water hammer, and affords a positive seal in closed position. Valves are available with various abrasive and corrosive-resistant compounds.—United States Rubber Co., Rockefeller Center, New York 20, N. Y.



**FIVE-TON TANDEM ROLLER**—Retractable-wheel self-contained roller has a full 5-ton weight. The retractable-wheel permits it being towed at normal highway speeds. Two hydraulic cylinders raise and lower trailing wheels. When towed, the wheels ride 9 in. off the ground. Power for the roller is supplied by a 4-cyl gasoline engine.—Huber Mfg. Co., Marion, Ohio.

**BATTERY-CELL TESTER**—King Model CC-3 cell tester has a 2½-in. meter calibrated to indicate charge-discharge-dead, as well as actual cell voltage. It has a temperature-compensated load of approximately 200 amps (average engine starter load) to provide an accurate battery test.—Electric Heat Control Co., 3123 Inman Ave., Cleveland 5, Ohio.



**SCAFFOLD SWING STAGE**—Waco swing stage has an automatic brake combined with a pawl engaged in a ratchet as safety devices. Both perform the same function so that if one fails, the other will hold. Other safety features are the toe board, guard rail, and steel airplane-type cable. Up to 150 ft. of cable can be used on the drum. A sling arrangement can be employed when more cable is needed. Stirrups are available for platforms or planking 24 to 30 in. wide. Platforms may be had in a variety of lengths.—Wilson-Albrecht Co., Inc., 3563 Wooddale Ave., Minneapolis 16, Minn.

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1. Shows how to estimate construction costs quickly and accurately. Gives step-by-step instructions for estimating construction work of all kinds, including excavations, all parts of buildings, concrete, structural steel, and material transportation, profit, overhead, etc. Contains useful tables, diagrams and illustrative estimates.

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|----------------|--|
| 0 (zero)       | 0 (inst.)  |
| 1              | 8  |
| 2              | 25   |
| 3              | 50   |
| 4              | 75   |
| 5              | 100  |
| 6              | 125  |
| 7              | 150  |
| 8              | 175  |
| 9              | 200  |
| 10             | 250  |
| 11             | 300  |
| 12             | 350  |
| 13             | 400  |
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| 16             | 550  |

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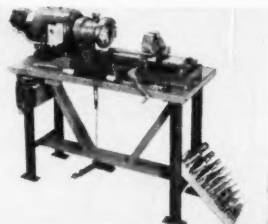


**PLIER-GRIP CALKING GUN**—Can-Do plier-grip calking gun takes either cartridge or bulk compounds of any consistency. In operation, the feed rod extends under the arm and is out of the way when the plunger is extended. A finger-tip pressure release stops the flow of material. A complete line of interchangeable noz-

zles is available. The 6½-in. gun has a 15-cu.-in. capacity; the 10-in., a 30-cu.-in. capacity; and the 15-in., a 45-cu.-in. capacity.—**Western Reserve Mfg. Co., 3719 E. 93rd St., Cleveland 5, Ohio.**

**TRAILER-TYPE SPRAYER**—High-pressure sprayer serves two purposes—for spray eradication of weeds along highway shoulders; or as a completely mobile fire-fighting unit. Features include: Hydraulically actuated 27-ft boom, drop nozzles on a 360-deg swivel, 275-gal tank capacity, quick-change bayonet-type drop-nozzle fittings, and pump with only one moving part. Two pumps

are scheduled: Model A, rated at 3 to 5 gpm at 300 psi; and Model B, rated at 6 to 9 gpm at 600 psi. The frame provides a tread adjustment from 52 to 80 in. Agitation is mechanical and positive the moment engine is started.—**Lindberg Agricultural Sprayer Co., 5155 Loraine Ave., Detroit 8, Mich.**



#### HOSE-LINE ASSEMBLY MACHINE

—Model F-1766 hose-line assembly machine handles all standard Aeroquip fittings including male pipe, swivel, flange, and elbow types. The machine is mounted on a heavy cast-iron base and is equipped with speed selector, tool-steel mandrels, and interchangeable jaws. The machine is small enough to be mounted on any ordinary shop bench.—**Aeroquip Corp., Jackson, Mich.**

**TRANSFORMER WELDER**—Transformer-type ac arc welder has no moving parts. Welding current is adjusted by an electrical reactor. Two models are in production: Model TSP-205-C with power factor correction rated 200 amps at 30 v; and Model TSP-182-C with power factor correction and limited input for operation on REA lines rated 180 amps at 25 v. A rheostat permits remote control. Steel casters are standard equipment.—**Hobart Bros. Co., Hobart Square, Troy, Ohio.**



#### PORTABLE AIR COMPRESSORS

Two new Blue Brute portable air compressors are available in hand-truck and trailer models. These two-stage air-cooled compressors have a 30-ft capacity at 100 lb pressures; with a maximum operating pressure of 150 lb. Powered by a hand-cranked air-cooled gasoline engine, the compressors have patented feather valve, suction-valve unloading, and general design readily accessible for easy maintenance.—**Worthington Pump & Machinery Corp., Construction Equipment Division, Holyoke, Mass.**

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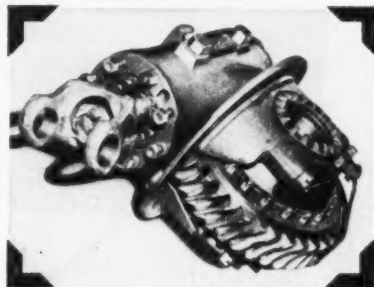
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# STANDARD ENGINEER'S REPORT

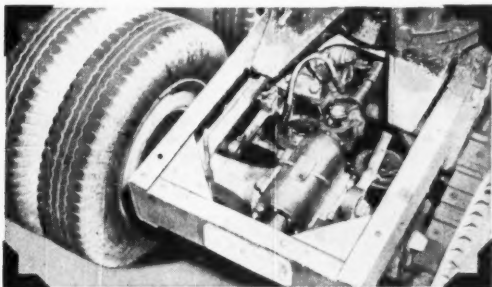
|            |   |
|------------|---|
| LUBRICANT  | DATA<br>RPM Gear Lubricant (compounded)             |
| UNIT       | "Semi" diesel truck                                 |
| PART       | Differential carrier assembly -<br>Timken Worm 3002 |
| CONDITIONS | Long Distance freight haul<br>- high speeds         |
| LOCATION   | San Francisco -<br>Los Angeles                      |
| FIRM       | Hills Transportation Co.,<br>San Francisco          |

## Practically no wear on worm gear in 235,000 miles



IN A TRANSPORT TRUCK DIFFERENTIAL lubricated with RPM Gear Lubricant (Compounded), this worm gear had been in constant service for 235,000 miles when the unit (right) was overhauled. Teeth were

still in excellent condition as the picture shows. The gear was replaced because of a loose spline. This was only the second overhaul for the differential unit in 648,326 miles of truck service.



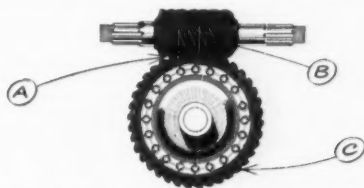
TWO "DROP-IN" UNITS of the same type were used together in the tandem differential of this transport truck. They pulled average daily loads of twenty tons on the highway in regular common-carrier service.

REMARKS: Because RPM Gear Lubricant (Compounded) has very high oiliness qualities and stability, it is especially valuable for the lubrication of bronze worm gears. It also meets the severe service conditions in transmission gear sets and conventional differentials. (For hypoids of all kinds, RPM Multi-Service Gear Lubricant is recommended.)



TRADEMARK "RPM" REG. U.S. PAT. OFF.

### How RPM Gear Lubricant (Compounded) prevents wear in worm and conventional gears



- A. Made from paraffine stocks with special compounds that help provide a tough film - gives extra tooth protection, withstands shock and overloads.
- B. Has high resistance to oxidation - resists deposit formation, assures lubrication in high temperatures.
- C. Contains foam inhibitor - prevents high gear-case pressures.

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costs are remarkably low.  
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#### CAPACITIES:

Shovels  $\frac{3}{4}$  to 6 yards

Cranes to 110 tons

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Also Rubber Mounted Cranes  
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April 16, 1950

Lima Shovel & Crane Division  
Lima, Ohio

Gentlemen:

Our Lima Type 54 "Paymaster" did double duty service on our recent job of constructing piers for a million gallon tank at St. Louis Park, Minnesota, enabling us to finish the ten piers and a concrete structure in the center in just eleven days!

Each pier required about 60 yards of excavation, and the pouring of about 30 yards of concrete, and the center structure approximately the same. Our Lima did both jobs - excavating and pouring one pier each construction day. Excavating from the second, etc. Even though the machine was waiting much of the time, because ground conditions would have made much of necessary for getting it to the piers in any other way. We used a 35 foot boom and while the machine could easily have handled  $\frac{3}{4}$  yard buckets, we used  $1\frac{1}{2}$  yard clamshell and concrete buckets which were the only ones available at the time.

We have had this Lima since January 1946, and since then it has been in continuous service. We use it for a wide range of duties including trenching with a pull shovel attachment for water and sewer mains, excavating sewer lift stations and disposal plants, etc. We have had no breakdowns of any sort, and maintenance costs are remarkably low. We are more than satisfied with this Lima. It is the first we ever owned, but we do not expect it to be the last.

Yours very truly,

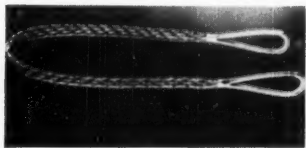
**PHELPS DRAKE CO., INC.**

*G. A. Drake, Jr.*  
G. A. Drake, Jr.



**VIBRATING SIEVE SHAKER**—Vibrating action of test sieve shaker is produced by electro-magnetic drive resulting in 3,600 vibrations per min from a 110-v 60-cycle ac circuit. The shaker has no bearings, gears, belts, or pulleys. The shaker holds six 8-in.-dia sieves. Reset timer provides accurately timed test periods.—**Syntro Co.**, 500 Lexington, Homer City, Pa.

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**FLAT-BRAIDED SLING**—This sling is designed to provide a relatively wide, flat bearing surface with sling thickness held to a minimum. The Drew 14-part Type-1 CT sling is fabricated from one endless wire rope. Sling ends terminate in natural loops fitted with Crescent thimbles. It is made to order in length and safe-load capacity required.—**Macwhyte Co.**, 2941 Fourteenth Ave., Kenosha, Wis.



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• High-level, blast hole drilling is a cinch with husky McCarthy Horizontal Drills.

These extra rugged tools are compactly built for mounting on any kind of mobile platform. They're equipped with finger-tip controls and plenty of power for boring 4, 6 and 8-inch blast holes through shale, sandrock and soft limestones. Four special individual leveling jacks make setups easier.

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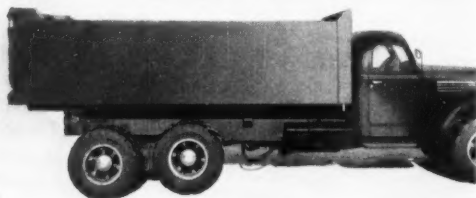
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## BODY AND HOIST CONSTRUCTION



Photos show PERFECTION No. 354 Special Dump Body and No. 1027 Iso-Draulic Rail-A-Lift mounted on International truck. Length of body 192", width 96", capacity 16 yds. Can be made in various sizes.

On this PERFECTION Body the triangular side braces are placed on the INSIDE of the side plates--permitting the sides to be mounted flush with edges of the platform. This design increases the inside dimension between sides almost one foot, resulting in greater volume capacity. In comparison with bodies having outside braces, this design also has the advantage of permitting the use of a smaller body for any given volume capacity requirement. This reduction in body size may be in height, length or width, as desired.



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STAKE and DUMP BODIES  
HYDRAULIC HOISTS

**FOR ANY TRUCK**  
STANDARD or SPECIAL UNITS  
IN ALL SIZES - FOR ANY USE



**LOCOMOTIVE CRANE**—Torqflo locomotive crane is available in three models with capacities from 25 to 50 tons. Feature of all three models is the Torqflo drive, a hydraulic power-transmission unit. This unit controls travel, swing, hoist, and boom-hoist mechanisms.—**The Browning Crane & Shovel Co., 16226 Waterloo Road, N. E., Cleveland 10, Ohio.**

**BRAKE MOTOR**—Tri-Clad motors are now equipped with Stearns magnetic brakes as unit apparatus. Recommended for use on cranes, hoists, and conveyors, the Tri-Clad motors up to 20 hp, 90 lb-ft static torque have this explosion-proof electrically operated brake. A wear indicator tells when to make a screwdriver adjustment to compensate for wear. All brakes are totally enclosed. The brake is designed to hold even if power fails during operation.—**General Electric Co., Apparatus News Bureau, Schenectady 5, N. Y.**

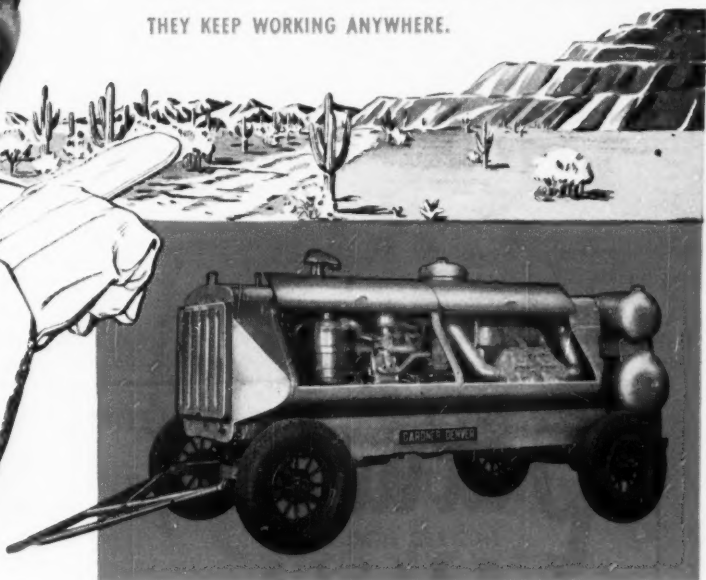


**AIRBORNE SURVEYOR'S TARGET**—Balloon combined with kite provides a means for lifting and suspending surveyors' targets at heights to 2,000 ft. This facilitates surveying operations in mountainous terrain and other areas obscured by forests or man-made structures. In aerial mapping, the Kyttoon can be used to establish horizontal tie points on the ground. Results with the Kyttoon have been found to be accurate and acceptable for third-order work. The balloon is filled with helium or hydrogen.—**Dewey & Almy Chemical Co., Cambridge, Mass.**

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HIS OUTFIT IS JUST FINISHING A DESERT PROJECT WHERE THE TEMPERATURE REACHED 110°; NEXT WEEK HE MOVES TO A ROCKY MOUNTAIN PASS - HIGHEST ELEVATION, 10,057 FEET. THAT'S WHY HE USES GARDNER-DENVER PORTABLES. THEY KEEP WORKING ANYWHERE.



*Gardner-Denver Portable Compressors are available in sizes from 105 to 500 cu. ft. actual capacity.*

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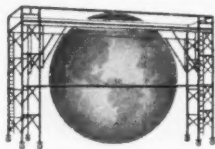
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Gardner-Denver Company, Quincy, Illinois

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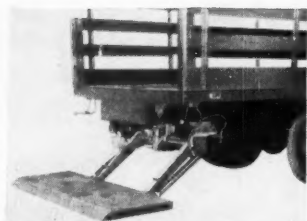
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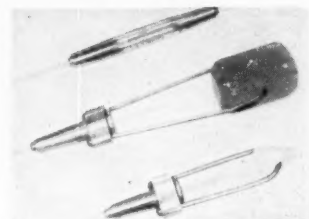


**ELEVATING TAILGATE**—Hydraulically controlled elevating tailgate is operated by a single lever. Hydrogate lowers to within a few inches of the ground, and stops or holds at any height desired. Marion safety feature prevents tailgate from dropping accidentally. Rated lifting capacity is 2,000 lb. Unit fits all new and old model trucks. — **Marion Metal Products Co., Marion, Ohio.**

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of the warm air. Furnace occupies 5 ft of floor space.—**The Coleman Co., Inc., Wichita, Kans.**

**WELDING TRANSFORMER**—Model 400E welding transformer has a 70 to 585 amp welding range. Rated 400 amps at 60% duty cycle, it retains a full 75-v open-circuit voltage. Ball-bearing coil-moving screw provides quiet operation and easy adjustment. —**A. O. Smith Corp., P. O. Box 584, Milwaukee 1, Wis.**



**AUTOMATIC SPLICES, DEAD-ENDS**—Holding power of automatic-type splices (Strandlink) and dead-ends (Strandvise) is said to exceed ultimate strength of standard steel-strand wire rope. Available in sizes for 5/16- and ¾-in. steel-strand messenger, static, and guy wires. Gripping jaws are composed of case-hardened steel teeth.—**Reliable Electric Co., 3145 Carroll Ave., Chicago 12, Ill.**

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D R I L L S

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**at better than  
A FOOT A MINUTE!!**

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**Damp-resistant product** for coating interior of exterior masonry walls is a non-fibrated liquid asphalt compound, free of coal tar. Plasterbond dries with a tacky, elastic film that permits plastering after 24 hr. Foundation Coating resists seepage of underground moisture through exterior masonry or concrete walls below grade. Both products can be applied by brush or spraying. Maker: The Philip Carey Mfg. Co., Cincinnati 15, Ohio.

**Metal abrasive cut-off machine** cuts with milled-like finish to tolerances of 0.008 in. Handles all types of structural materials. Manufactured by: Stone Machinery Co., Manlius, N. Y.

**Variable-speed transmission** for fractional-horsepower motors features automatic speed-locking device which keeps pulley in desired position. Maker: Frazier & Son, Belleville, N. J.

**Water-repellent coating** of a transparent nature is used for above grade, exterior masonry walls. Ranetite No. V coating contains polysiloxane resin. Maker: Ranetite Mfg. Co., Inc., St. Louis 4, Mo.

**Hardfacing alloy** (Aircolite 59) is designed primarily for applications involving high stress abrasion with medium impact. It is composed principally of chromium, molybdenum, carbon, and iron. Available from: Air Reduction Sales Co., New York 17, N. Y.

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**Threadless pipe fitting** is easily installed using a hack saw and monkey wrench. Tested to withstand pressures of 2,000 psi, they are manufactured for use with ½- to 1½-in. pipe in tees, couplings, and elbows. Made by: Union Products Co., Minneapolis, Minn.



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The photographer who took this picture of Naylor Pipe on a huge dam project in Mexico relayed these words from the engineers on the job:

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Write for Catalog No. 44 to get the full details on this distinctive Naylor Lockseam Spiralweld Pipe available in sizes from 4" to 30" in diameter and thicknesses from 14 to 7 gauge.



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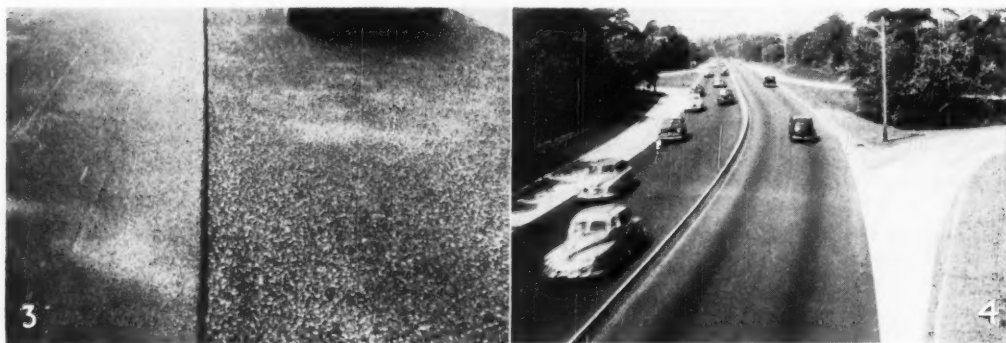
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# Where peak traffic hits 60,000 vehicles a day



## Resurfacing part of Southern State Parkway, Long Island, N. Y. with resilient, heavy-duty Texaco Asphaltic Concrete



### PHOTOGRAPHS

1. Laying the wearing surface of a two-course Texaco Asphaltic Concrete pavement on Southern State Parkway.
2. Note the skid-resistant texture of this Texaco Asphaltic Concrete pavement, which assures maximum safety to motorists.
3. The 1½-inch binder course is shown at the right and 1-inch wearing surface at the left in this photo.
4. The Texaco Asphaltic Concrete on Southern State Parkway was laid by the Standard Bitulithic Company, Baldwin, N. Y.

Southern State Parkway is part of a system of beautifully landscaped parkways, which bring Long Island's fine State parks, bathing beaches and other attractions within easy reach of New York City. During the summer, Sunday and holiday traffic on Southern State Parkway reaches 60,000 vehicles in 24 hours, with a high of 40,000 cars a day on weekdays.

Last fall, a 2½-mile section of Southern State Parkway, beginning at the New York City line, was resurfaced with a two-course Texaco Asphaltic Concrete pavement, consisting of 1½-inch binder course and 1-inch wearing surface. Its construction on an important part of this popular

parkway helps explain why hot-mix, hot-laid asphaltic concrete paving has been chosen in the past by road builders throughout the country to serve exceptionally heavy traffic.

Wherever main highways, busy city streets and major airports call for pavement capable of withstanding unusually hard wear, resilient Texaco Asphaltic Concrete's rugged durability and low maintenance cost make it a sound choice.

Complete information on Texaco Asphaltic Concrete and all other types of asphalt construction for streets, highways and airports can be secured without obligation by writing our nearest office.

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ment Co., 4847 Anaheim Telegraph  
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218 North Marine Ave.

## COLORADO

Denver 3, Central Supply Company,  
1171 Lincoln St.

## DISTRICT OF COLUMBIA

Washington, Diesel & Ignition Ser-  
vice, Inc., 925 Girard St., N. E.

## FLORIDA

Jacksonville, Patten Sales Co., Inc.,  
1021 Hogan St.  
Miami 36, Florida Diesel Service  
Co., 1930 N. Miami Ave.

Tampa, Stuart Diesel Service, 3101  
4th Ave.  
West Palm Beach, Sutcliffe's Elec-  
tric Co., 222 North Olive Ave.

## GEORGIA

Atlanta 3, Auto Electric & Magneto  
Co., 477 Spring St., N. W.

## IDAHO

Boise, Midwest Service & Supply  
Co., 1208 Grove St.  
Lewiston, Osterman Diesel & Electric  
Co., 1610 Main St.

## ILLINOIS

Chicago 16, Illinois Auto Electric  
Co., 2011-37 Indiana Ave.  
Rock Island, Lohse Automotive Ser-  
vice, 430 17th Street

## INDIANA

Indianapolis 4, Gulling Auto Elec-  
tric Inc., 450 N. Capitol Ave.

## IOWA

Cedar Rapids, Edwards Carburetor  
& Electric, Inc., 209 Seventh St.,  
South-East  
Des Moines, Electrical Service &  
Sales Co., 1313 Walnut St.

## KANSAS

Wichita 2, E. S. Cowie Electric Co.,  
230 S. Topeka Ave.

## KENTUCKY

Louisville, Schaff Auto Electric Co.,  
439 East Broadway

## LOUISIANA

New Orleans 13, John M. Walton,  
Inc., 1050 Carondelet St.  
Shreveport, Vaughn Tractor & Auto  
Parts Co., 124 Airport Drive

## MAINE

Portland 5, Portland Tractor Co.,  
Inc., 803 Forest Ave.

## MARYLAND

Baltimore 1, Parks and Hull Auto-  
motive Corp., 1033 Cathedral St.  
Baltimore, Stephen Seth & Co., 876  
Park Ave.

## MASSACHUSETTS

Boston 15, W. J. Connell Company,  
121 Brookline Ave.  
Boston 10, Wharf Machine & Elec-  
tric Co., Inc., Fish Pier Road  
Fairhaven, Hathaway Machinery Co.,  
Inc., Hathaway-Breley Wharf

## MICHIGAN

Detroit, Knorr-Maynard, Inc., 5743  
N. Woodward Ave.

## MINNESOTA

Minneapolis, George Nussbaum Die-  
sel Service Co., 3157 15th Ave.,  
South  
Minneapolis 2, Reinhard Bros. Co.,  
Inc., 11 South 9th St.

## MISSOURI

Kansas City 8, Electrical & Magneto  
Service Co., 2538 Grand Ave.  
St. Louis 23, Diesel Fuel Injection  
Service Co., 9311 So. Broadway  
St. Louis 3, Electric Parts and Ser-  
vice Co., 2900 Washington Blvd.

## MONTANA

Billings, Original Equipment, Inc.,  
423 North Broadway

## NEBRASKA

Omaha 2, Carl A. Anderson, Inc.,  
16th and Jones

## NEW JERSEY

Newark 2, Tire Trading Company,  
Inc., 239 Halsey St.

## NEW YORK

Brooklyn 9, E. A. Wildermuth, Inc.,  
1102 Atlantic Ave.  
Bulivar, Bulivar Magneto Co., 60  
Wellsville St.  
Buffalo 8, Hettrich Electric Service,  
1032 Elliott St.  
New York 19, American Bosch Corp.,  
New York Service Sales Division,  
401 W. 51st St.  
Syracuse 4, F. A. Crossman, Inc.,  
143 West Genesee St.  
Troy, Ehrlich Electric Service, Inc.,  
200 Fourth St.  
Utica, Stiefvater Electric Co., Inc.,  
320-322 Lafayette St.

## NORTH CAROLINA

Charlotte, Carolina Kim & Wheel  
Co., 301 East 8th St.

## NORTH DAKOTA

Fargo, Northwestern Diesel Equip-  
ment Service, 2800 Front St.

## OHIO

Cincinnati, Tri-State Distributing  
Corp., Broadway at Eighth  
Cleveland 14, The Cleveland Igni-  
tion Co., 1301 Superior Ave.  
Columbus 15, Columbus Ignition  
Co., 211 Neilson Ave.  
Lisbon, Diesel Service Co., 234 East  
Washington St.

## OKLAHOMA

Oklahoma City 2, American Electric  
Ignition Co., 124 N. W. 8th St.  
Tulsa, Magneto Ignition Company,  
701 West 5th St.

## OREGON

Klamath Falls, Diesel & Electric  
Service, 1950 So. Sixth St.  
Pendleton, Eds Magneto & Igni-  
tion Co., S. W. 18th and Court Sts.  
Portland 14, Automotive Products,  
Inc., 1700 Southeast Grand Ave.

## PENNSYLVANIA

Hazleton, Anthracite Injection Co.,  
30th and North Church Sts.  
Philadelphia, Sullivan Brothers, 1718  
Fairmount Ave.  
Pittsburgh 13, Automotive Ignition  
Co., Inc., 4358-64 Penn. Ave.

## SOUTH CAROLINA

Charleston, Diesel Fuel Injection  
Service, Adger's Wharf, P. O. Box  
512

## TENNESSEE

Knoxville, Diesel Magneto Service  
Co., 1209 Island Home Ave.  
Memphis 4, Automotive Elec. Ser-  
vice Co., 982 Linden Ave.

## TEXAS

Dallas 1, Beard & Stone Electric  
Co., Inc., 2101 Bryan St.  
El Paso, Oakes Battery & Electric  
Co., 423 Texas St.  
Houston 1, Beard & Stone Electric  
Co., Inc., 805 Polk Ave., P. O.  
Box 1717  
Odessa, Electric Service & Supply,  
P. O. Box 1471  
San Antonio, S. X. Callahan, 425 N.  
Flores St.  
San Antonio, Womack Bros., 1018 S.  
Presa St.

## UTAH

Salt Lake City 2, Koepsel & Love,  
47 East 7th South St.

## VIRGINIA

Norfolk, Diesel Injection Sales and  
Service, 710 Union St.  
Richmond, C. H. Woodward Electric  
Co., Inc., 709 W. Broad St.

## WASHINGTON

Everett, Cordz Auto Electric, 2913  
Rucker Ave.  
Rosalia, Van's Diesel Electric Co.,  
P. O. Box 560  
Seattle 1, Seattle Injector Co., 2706  
Second Ave.

Seattle, Sunset Electric Co., 300  
Westlake North, P. O. Box 3148  
Spokane, Sunset Electric Co., North  
703 Division St.  
Walla Walla, Industrial Products  
Co., 610 N. Ninth St.

## WEST VIRGINIA

Hurricane, Beard Engine Equipment  
Co., 3474 Teays Valley Road

## WISCONSIN

Milwaukee 2, Wisconsin Magneto  
Company, 918 N. Broadway

## CANADA

Calgary, Hutton's, 131-11th Ave.,  
W.  
Edmonton, Smith Battery & Auto  
Electric, 10125-105th St.  
Montreal, International Electric Co.,  
Ltd., 1037 Bligny St.  
Regina, Electric Motor Service, 1734  
Broad St.  
Toronto, A. Cross & Co., Ltd., 45  
Elm St.  
Toronto, Auto Electric Service Co.,  
Ltd., 1009 Bay St.  
Vancouver, Jeffre & Jeffre, Ltd.,  
775 Homer St.  
Vancouver, Macfarlane & Co., 1257  
Seymour St.  
Vancouver, Vivian Engine Works,  
Ltd., 1440 Station St.  
Winnipeg, Brown & Murray, Ltd.,  
237-241 Fort St.

## ALASKA

Juneau, Parsons Electric Company,  
Second and Seward Sts., P. O.  
Box 1749

## HAWAIIAN ISLANDS

Honolulu, Honolulu Iron Works Co.,  
P. O. Box 3140

## PUERTO RICO

San Juan, General Farm Equipment  
Co., Tract-Miramar, Sanfuerce, P. O.  
Box 3588

## MEXICO

Guadalajara, Jalisco, Electro Diesel  
de Occidente, Apartado No. 297  
Mexico, Baja California, Distribu-  
dora del Pacifico  
Mexico, D. F., Automoto Servicio  
S. A., Fray Servando Teresa de  
Mier 242  
Monterrey, Nuevo Leon, Electro Die-  
sel S. A., Esq. Avenida Morelos  
y Zuazua  
Torreón, Coahuila, Servicio Diesel  
Electrico S. de R. L., Guadalupe  
Victoria No. 216-Sur.

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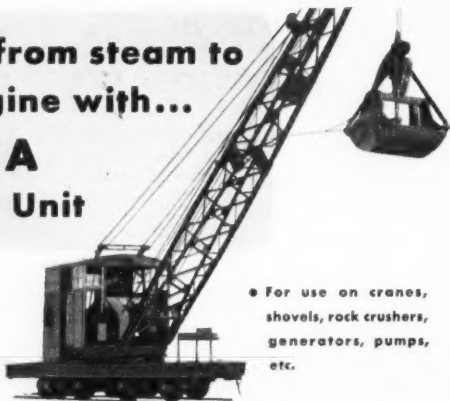
# America's Greatest Name in Fuel Injection Equipment

AMERICAN BOSCH CORPORATION • SPRINGFIELD, MASS., U.S.A.

## Converts from steam to diesel engine with...

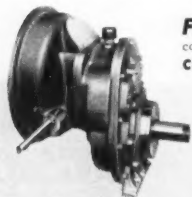
### COTTA Reduction Unit

- Broad range of ratios
- Input torque from 150 to 1350 foot pounds



- For use on cranes, shovels, rock crushers, generators, pumps, etc.

When Lincoln Crushed Stone Co. of Joliet, Illinois converted a crane from steam to diesel engine, a Cotta Model SRIOE Reduction Unit was used to adapt new engine output speed to meet conditions in the original crane mechanism. The result — a modernized crane at remarkably low cost. Tell us *your* rebuilding or speed reduction problem — Cotta engineers will help you select the right unit for best performance.



**FREE DATA!** Diagrams, capacity tables, dimensions and complete specifications sent free on request.  
**COTTA TRANSMISSION CO., ROCKFORD, ILLINOIS**



**COTTA**  
HEAVY-DUTY  
REDUCTION UNITS

## INSURE YOUR PROFITS with the New MASTER UNIVERSAL CONCRETE VIBRATORS

**LIGHT WEIGHT • HIGH SPEED • GASOLINE  
OR ELECTRIC POWERED**

Master Universal Concrete Vibrators are simple and rugged, immediately usable by unskilled labor. Light weight, high speed, powered by either electric or gasoline motors, they save time and costs ... protect and increase your profits.

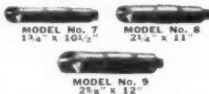
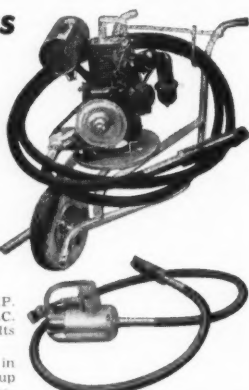
They work any time, any place. The 24 lb. 1½ H.P. and 26 lb. 2½ H.P. electric models operate from A.C. or D.C. current, 25 to 80 cycles, 110 volts, or 220 volts when specified.

The 1½ H.P. electric motor has a vibrating speed in concrete up to 9000 R.P.M., and the 2½ H.P. motor up to and over 9500 R.P.M. The 1½ H.P. lightweight gasoline engine powered vibrator has a vibrating speed in concrete up to 9000 R.P.M., and the 4.65 H.P. gasoline engine powered vibrator 9500 R.P.M. or more.

Electric vibrators can be equipped with 22", 6", 12" or 21" lengths of Master Reversible Flexdrive. Gasoline models use 6", 12" or 21" lengths. Additional length up to 33" 6" can be used by adding the No. 72 Flexdrive coupling and extra 6" or 12" lengths of Flexdrive. A concrete Surfacing Tool is available for use with all Master Vibrators. You'll save time and labor and make more money ... with Master Universal Concrete Vibrators. For complete specifications and prices, write, wire or phone today for Catalog No. 964.

Turn-A-Trowels • Vibratory Finishing Screeds • Power Blow Electric Hammers  
and Spades • Grinders • Engine Driven Generator Plants • Backfill Tampers

**MASTER VIBRATOR COMPANY**  
222 Davis Avenue • Dayton 1, Ohio



The Universal Vibrating Ends shown above can be used with any model of Master Universal Vibrator. No. 9 end gives vibration equal to 3" diameter vibrating end.

Drive-on rubber protective sleeves are available for all models of Vibrating Ends.

**Hard-facing alloys** with ac/dc coatings are announced by Stoody. These electrodes, formerly limited to dc application only, are Stoodite, Tube Borium, and Borod. The company will continue to produce the original dc electrodes.

**Ladder platform** attaches to any round ladder rung. The all-aluminum Res-Top has a non-slip-type safety platform measuring 12x5 in. Manufactured by Res-Tep, Inc., Euclid 17, Ohio.

**Speed governor** is actuated by vehicle's miles-per-hour rate, permitting delivery of extra power for climbing grade (providing pre-set speed is not exceeded). Produced by: Speedmaster Corp., Plainville, Conn.

**Speed reducer** is stocked in 24 different right-angle-drive assemblies. Range varies from 1/20 to ¼ hp. Manufactured by: Winfield H. Smith Corp., Springfield, N. Y.

**Water-repellent ignition seal**, distributed by General Motors Corp., resists action of water, condensation, leakage, acid, fungus, and rust. Sherolite can be applied by spraying or brushing.

**Flooring material**, applied by trowel, produces a woodlike surface. It can be applied to rough, uneven surfaces without underlayment. Setting time is 4 hr. Produced by: Roc-Wood Flooring, Chicago 16, Ill.

**FM communication unit** for the 30 to 50 megacycle band is available from Radio Specialty Mfg. Co. of Portland, Ore. Total weight including self-contained batteries is less than 25 lb. Output can be as high as 7½ watts.

**Portable hand lamp** has a 4-in. lamp-head, is powered by a standard 6-v lantern battery, and weighs 48 oz. Produced by: U-C Lite Mfg. Co., Chicago 22, Ill.

**Diesel-driven generators** in five new models have been added to the line of D. W. Onan & Sons, Inc., Minneapolis, Minn. Equipped with automatic voltage regulators, they range in size from 12½ to 55 kw. All have gasoline-engine starting.

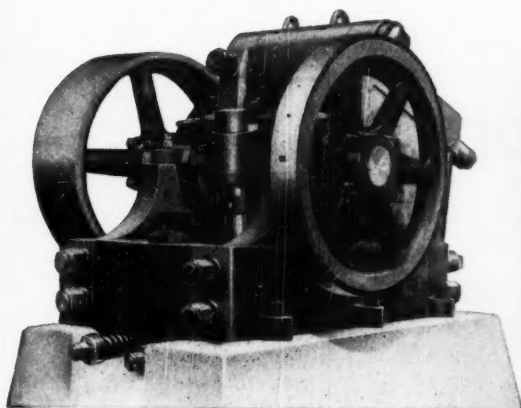
**Wood-study kit** contains 54 specimens of commercial species of wood and wood products. A 10-power hand lens, knife, and 84-p descriptive manual are included. Distributed by: Timber Engineering Co., Washington 5, D. C.

**Offset-type bar hanger boxes** for armored and non-metallic cable installations are completely assembled. Ease of installation is feature of this new General Electric assembly.

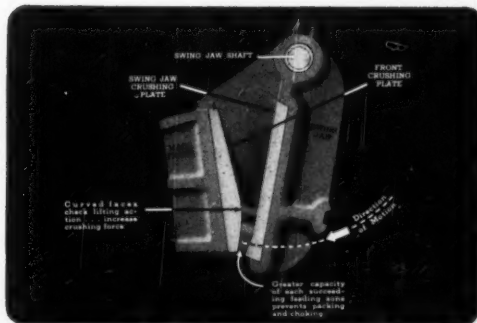
# TRAYLOR CURVED JAW CRUSHER PLATES

more than double aggregate production

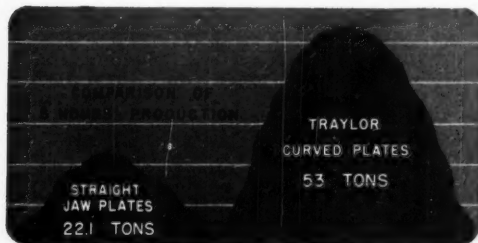
... cut costs per ton more than half



A 12" x 24" Blake type crusher with ordinary straight jaw plates required 12 hours to reduce 53 tons of rock. The same crusher ... at the same setting and with the same stone ... stepped up production to 53 tons in just five hours after being fitted with Traylor Curved Jaw Plates.



The faces of Traylor Curved Jaw Plates are scientifically proportioned so that the faces are opposed to the line of motion. Lifting and churning are eliminated ... all power is used for crushing. Choking is prevented by the increasing size of each succeeding feeding zone. Only Traylor Curved Jaw Plates offer these advantages.



This graph tells the story. For every ton per hour that was crushed with straight jaw plates, 2.4 tons were crushed with Traylor Curved Jaw Plates. That means a reduction of 58% in operating cost!

**On-the-job stone production  
is more dependable ... costs less  
with TRAYLOR JAW CRUSHERS**

Work moves on schedule with a Traylor Jaw Crusher on the job. If you are losing valuable time because of delays in stone production ... if your aggregate costs are running too high ... investigate a Traylor Jaw Crusher. Outline your requirements ... we'll gladly send you a free bulletin on the Traylor Crusher best suited to your needs.

# Traylor

Jaw, Reduction and Gyratory Crushers  
Rod Mills • Crushing Rolls  
Apron and Grizzly Feeders

**TRAYLOR ENGINEERING & MANUFACTURING CO.**  
169 Mill St., Allentown, Pa.

Sales Offices: New York, N. Y., Chicago, Ill., Los Angeles, Calif.  
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.

**A "TRAYLOR" LEADS TO GREATER PROFITS**



## New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use

**SECTIONAL-TRUSS BELT CONVEYOR**—Selection and layout information of sectional-truss belt conveyors is interestingly presented in

a new 40-p catalog. The Redi-Fab series described is available in 49 lengths, 3 widths, and with numerous other variables and accessories. A feature of the catalog is a layout sheet which, coupled with the engineering data presented, permits the reader to make his own layout right down to the location and selection of supports.—**Barber-Greene Co., Aurora, Ill.**

**PAVER USED FOR BUILDINGS**—"How Would You Do These Jobs" is the title of a catalog describing the use of the MultiFoote paver with HighLift boom as a complete mixing and pouring tool for building construction. The catalog shows how

the 23-ft clearance under the bucket permits all-year use of the paver for pouring concrete directly to forms or concrete buggies on the structure of any one-story wall. The catalog contains many photographs showing actual jobs in which the paver has been used in this manner.—**The Foote Co., Inc., Subs. of the Blaw-Knox Co., Nunda, N. Y.**

**CAST-IRON PULLEYS**—Complete line of Blue-Face cast-iron pulleys is listed and described in 16-p Bulletin 33. Table of contents on front cover facilitates quick reference. Supplementary Bulletin 35 carries case histories of installations of the Belt-Saver tail pulley for bucket elevators and belt conveyors. Pulley is furnished in diameter sizes from 6 to 40 in.—**Sprout-Waldron & Co., Inc., Muncy, Pa.**

**CONCRETE INSERTS**—Bulletin (4 pp) describes advantages of Unistrut concrete inserts. Bulletin CI-2 emphasizes the fact that these inserts permit attachment of fittings at any point along the insert face without disturbing attachments previously made. Complete specifications and ordering information are included.—**Unistrut Products Co., 1013 W. Washington St., Chicago 7, Ill.**

**WEATHER-RESISTANT COATING**—Proof Coating, a corrosion and weather-resistant roof coating and waterproofing for foundations, walls, and floors, is described in Catalog 501-R. Also described are Styx liquid roof paint, Styx mastic roof coating, Styx plastic roof cement, C-4 asphalt primer, Tite roof paint, Asbestite roof coating, Plastite roof cement, C-4 Blind Nailing cement, and Seal Tight foundation waterproofer.—**Coopers Creek Chemical Corp., West Conshohocken, Pa.**

**MECHANICAL, HYDRAULIC JACKS**—Specifications and application information on all sizes and types of mechanical and hydraulic jacks are included in 32-p Catalog 50. This letter-file-size catalog carries full details of the 123 models of ratchet lowering, hydraulic and screw-type jacks that comprise the standard Simplex line.—**Templeton, Kenly & Co., 1020 S. Central Ave., Chicago 44, W. Ill.**

**CRANEMEN AND HITCHERS MANUAL**—Safe procedures for cranimen and hitchers are described in a 36-p pocket manual (Form 25B6208A). The manual carries instructions for cranimen and hitchers, illustrates standard crane signals, shows how crane operation and inspection reports are executed, and carries reference tables which specify safe loads for wire rope, wrought iron and alloy-steel chain, manila rope, and eight-part braided slings.—**Allis-Chalmers Mfg. Co., Health & Safety Dept., Milwaukee, Wis.**

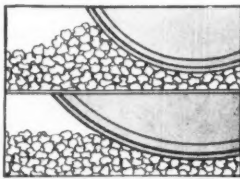
## APSCO TRENCH ROLLER



### Better 3 Ways

#### 1--Higher, Heavier Compression Roll

Slightly exaggerated drawing illustrates how smaller diameter roll tends to push material ahead while larger roll exerts greater downward compression. Net result—few wavy spots, less reworking.



**2--Improved, Hydraulic-controlled Leveling Wheel**—(with pneumatic tire) keeps machine on even keel regardless of trench depth. A 3" hydraulic cylinder easily raises or lowers wheel to desired height. Here again, the pneumatic-tired wheel facilitates loading on highway trailer—makes transporting safer.

#### 3--"Out-Of-Trench" Steering Wheel

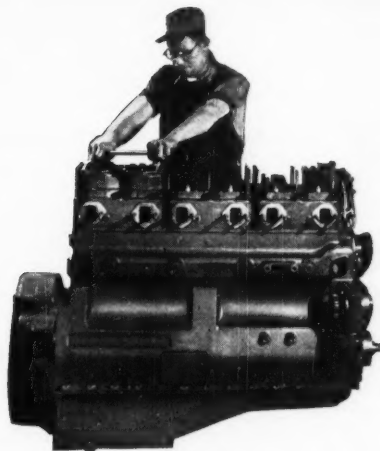
Keeping steering wheel on the old pavement instead of in trench greatly improves control and performance. Much easier to get roller out of trench.



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**ALL PURPOSE SPREADER CO. Elyria, Ohio U.S.A.**

## Cummins® Custom-built Diesels



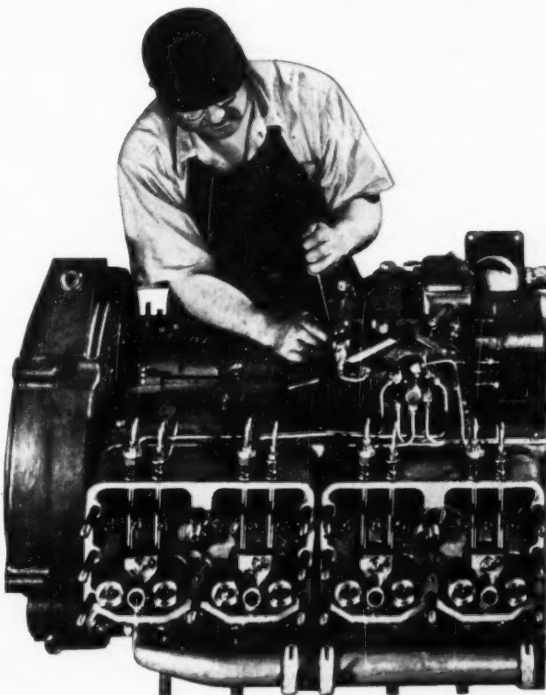
*Built  
not  
once  
but  
Twice*

### The better-built engine for better power profits

Every lightweight high-speed Cummins Diesel is actually built *twice*. After initial assembly, each engine is run-in on the test block. Then it is torn down and carefully re-inspected — after that it is re-assembled and tested *again* to assure *peak performance*. And that is only *one* example of the extra care, the precision-workmanship... that goes into every Cummins custom-made engine.

That's why a Cummins Diesel is an investment that has *greater earning power* for you. The finest of engine-craftsmanship... exclusive Cummins fuel system... and custom-built engines "that fit your job" make a rugged, quality-engineered Cummins Diesel the *better buy for your power needs*.

Contact your Cummins dealer. He has more facts to show you about making more profits with



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**Diesel power by  
CUMMINS**

**CUMMINS ENGINE COMPANY, INC. • COLUMBUS, IND.**

EXPORT: CUMMINS DIESEL EXPORT CORPORATION  
Columbus, Indiana, U. S. A. • Cable: Cumdies

Lightweight High-speed Diesel Engines (50-550 hp) for:  
On-highway trucks • off-highway trucks • buses • tractors • earth-  
movers • shovels • cranes • industrial locomotives • air compressors  
logging yarders and loaders • drilling rigs • centrifugal pumps  
generator sets and power units • work boats and pleasure craft.



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YOUR HOIST

with  
**COFFING**  
*Safety-Pulls*

To save unnecessary labor, to protect men and equipment is sound economy. That's why wise foremen specify Coffing Safety-Pull Ratchet Lever Hoists. Whether for raising and holding beams (as shown), repairing heavy machinery, stretching guard cables, or any of countless other jobs, these powerful tools provide

tireless lifting, holding, pulling *wherever used*—letting one man replace a crew.

Special ratchet and pawl cannot slip, yet chain is free-wheeling when not under load. Nine sizes to fit every requirement. Capacities from  $\frac{3}{4}$  to 15 tons—all factory tested at 100 percent overload. Find out how Coffing Safety-Pulls can bring added economy to both shop and field operations. Write for Bulletin D7SP.

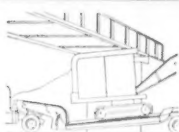


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Danville, Illinois

## The ROGERS

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DEMOUNTABLE GOOSENECK



STOOPS TO  
CLEAR LOW  
OVERHEAD  
OBSTRUCTIONS



RAISES ITS  
DECK TO  
CLEAR HIGH  
BANKED  
CROSSINGS



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NEW AND VALU-  
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IN TRAILER  
SERVICE

It embodies the kind of versatility that makes every haul easier, faster, more profitable.

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It's equally as rugged as the standard Rogers Gooseneck regardless of its detachable feature. And it's available on most Rogers Trailers and adaptable to many trailers of other makes.

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# ROGERS TRAILERS

EXPERIENCE builds 'em

PERFORMANCE sells 'em

ROGERS BROTHERS CORPORATION, 220 Orchard St., ALBION, PA.

### METRIC CONVERSION TABLES—

Conversions listed on this table are: Feet to meters, meters to feet, and inches into decimals of a foot. The inches-to-decimal scale reads from 0 to 11 $\frac{3}{4}$  in.; the feet-to-meter scale to 99 ft.; the meters-to-feet scale to 99 meters. Other miscellaneous conversion factors are also listed.—Robert S. Mayo, Lancaster, Pa.

### STATIONARY COMPRESSORS—

Air-Plus line of stationary compressors is illustrated and described in Bulletin JCS-0. Models listed include the EC-15, EC-25, EC-50, ED-75, and EC-80. These range in capacities from 60 to 365 cfm at 100 lb. Complete specifications and dimensions are listed for each of these units. Also described are the Packaged 60 compressor, pipeline after-cooler-separators, and air receivers.—The Jaeger Machine Co., 550 W. Spring St., Columbus 16, Ohio.

### FULL-TRACK TRENCH EXCAVATOR—

Specifications and operating advantages of the Badger Model 303-3 full-track trench excavator are listed in a 4-p folder. Among the features described in detail are the patented Badger shovel and cleaners, the arc-type reversible cross-conveyor, deeper digging range, and grade holder and sight. Photographs show recommended applications.—Badger Machine Co., Winona, Minn.

**CALCIUM CHLORIDE**—Use of calcium chloride for surface-consolidated roads is subject of a two-page condensed report. This report describes proper maintenance procedures for reshaping gravel roads, adding new materials, and applying calcium chloride.—Calcium Chloride Assn., 1200 Eighteenth St., N. W., Washington 6, D. C.

### STREET AND HIGHWAY SIGNS—

Complete information on Cataphote's line of traffic signs, street-name signs, danger beacons, and reflector buttons is included in Catalog 50 (24 pp). Special feature of the catalog is a listing of standard traffic signs, as designated and specified by the Public Roads Administration. Illustrations are provided for typical signs in each group produced by the company.—Cataphote Corp., 958 Wall, Toledo, Ohio.

### STEAM CLEANERS—

Operation and maintenance of steam cleaners is listed in a 9-p booklet. The booklet contains general information on steam cleaners, and a simple schematic diagram to illustrate its operating principles. A feature of the booklet is a list of possible sources of coil scale build-up which enables steam-cleaner users to circumvent these troubles. A series of do's and don'ts is also listed.—The DuBois Co., 1120 W. Front, Cincinnati 3, Ohio.

**FEEDER BULLETIN**—Traylor has issued a 20-p bulletin describing a complete line of apron, grizzly, table, and slurry feeders. Cutaway views of each type of feeder show interior construction. Installation photos show Traylor feeders working with all types of crushers, rotary kilns, and grinding mills.—**Traylor Engineering & Mfg. Co., 149 Mill St., Allentown, Pa.**

**COMPRESSED AIR**—Basic reference data on compressed air is contained in this 18-p booklet. Designed as a general non-technical review of compressed-air theory, it outlines how air is compressed, machines employed in compressing air, and basic principles of utilization of air power.—**Compressed Air & Gas Institute, 1410 Terminal Tower, Cleveland 13, Ohio.**

**POWERED WHEELBARROW**—Bulletin describing the improved Moto-Bug emphasizes the newly added hydraulic lift attachment. This fork-lift feature increases the unit's usefulness in special handling problems. Numerous photographs illustrate additional improvements and developments made on the Moto-Bug. A full page is devoted to a series of photographs showing the unit in various applications with different types of front-end attachments.—**Kwik-Mix Co., Subs. of Koehring Co., Port Washington, Wis.**

**DRAFTING ROOM SUPPLIES**—Listed in Berger's Catalog A is a complete line of drawing instruments, slide rules, T-squares, curves, triangles, and scales. Feature of the T-squares, curves, and protractors is that they are produced in eye-rest green plastic. The drawing instruments are made in the U. S. zone of Germany.—**Berger Scientific Supplies, Inc., 342 Madison Ave., New York 17, N. Y.**

**SELF-CONTAINED WAGON DRILL**—"Drive Your Light Wagon Drill and Compressor" is the title of Bulletin T-16 describing the 105 Tractair Mobilidril. It shows this combination tractor-compressor and light wagon drill in action, and gives complete specifications and dimension data.—**Le Roi Co., 1706 S. 68th St., Milwaukee 14, Wis.**

**WELDING MATERIALS**—Two catalogs now available contain detailed information on a line of welding electrodes and accessories. One bulletin (16 pp) contains two pages of data on each of seven Murex mild-steel arc-welding electrodes. The other bulletin (32 pp) describes the M&T line of arc-welding accessories which includes holders, helmets, cable, ground clamps, goggles, cleaning tools, and protective clothing.—**Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y.**

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Operators who put their machines out on the job must rely on equipment that can take it—that's why they rely on J-M INDUSTRIAL FRICTION MATERIALS to keep equipment operating on the job.

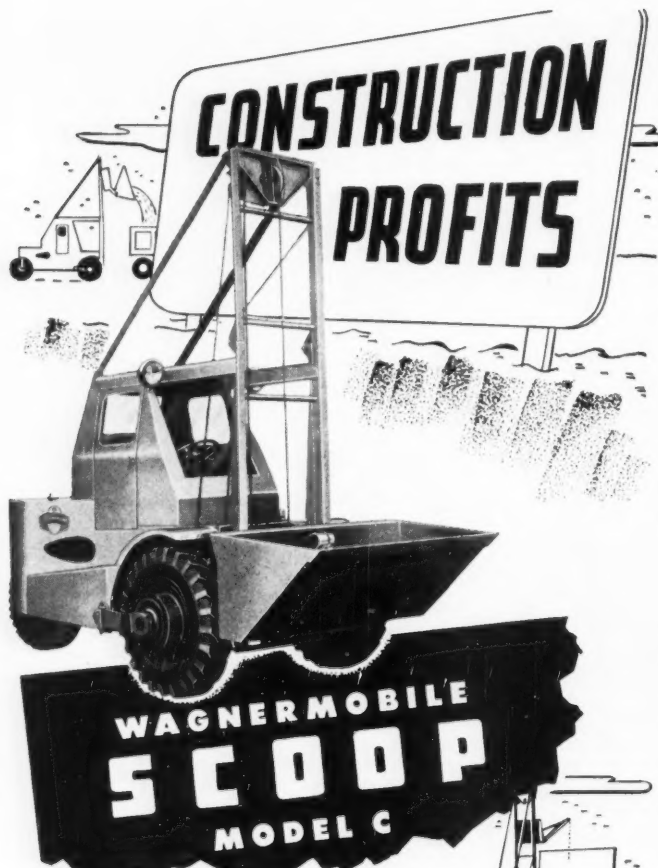
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The versatile Wagnermobile Model "C" Scoop saves time and labor costs with its many efficient uses in the construction field. "Quick-change" attachments mean extra profit on every job. Saves time and labor of bringing in "extra" equipment. Maintenance is minimized.

- Transports, elevates and pours concrete.
- Lifts heavy equipment.
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### ATTACHMENTS INCLUDE:

Scoops in 5 sizes— $\frac{3}{4}$  cu. yd. swivel type concrete hopper with 90-degree swing right or left. Lift Fork with 2, 3 or 4 prongs. Special Fork with tines for fertilizer or hay. Crane Boom. Track extensions up to total of 26 feet.

### FEATURES INCLUDE:

**Power Steering . . . Planetary Drive**

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Wagnermobile Model "C" Scoop also available with Chrysler Fluid Drive.

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**ELECTRICAL RACEWAYS**—Steel underfloor electrical raceway system is described in Catalog 606. This system is designed either for new construction or modernization. The catalog provides a complete suggested specification for a floor electrical distribution system. A typical Nep-conduct floor plan layout is also shown. Roughing-in dimensions are provided.—**National Electric Products Corp.**, Chamber of Commerce Bldg., Pittsburgh 19, Pa.

### PORTABLE WASHING PLANTS

How to attain higher capacities with greater mobility in aggregate washing operations is theme of Bulletin 1650. This 8-p bulletin gives complete information, with schematic flow diagrams, of Lippmann's new Washmore and Super Capacity portable washing plants. Information includes capacity and dimensional tables.—**Lippmann Engineering Works**, 4603 W. Mitchell St., Milwaukee 14, Wis.

### TRACTOR-DRAWN SCRAPER

Broadside describes the Model 625 scraper designed for use in conjunction with the Allis-Chalmers HD-19 tractor. Cutaway drawings are used to illustrate loading, carrying, and dumping and spreading functions; sectional views illustrate principal components of the 625; and photographs show the scraper at work on all types of earth-moving jobs.—**Gar Wood Industries, Inc.**, Findlay Division, Findlay, Ohio.

### DIESEL MOTOR GRADER

Heavy-duty diesel-powered road-building unit with hydromechanical controls is described in Bulletin G-139. Important features of the Huber motor grader are described; principal dimensions are listed; and specifications are included for the two power units available. Bulletin G-139 is 12 pp in length.—**Huber Mfg. Co.**, Marion, Ohio.

### COMPRESSOR; WAGON DRILLS

Two bulletins are now available describing Blue Brute construction equipment. Bulletin H-1200-B36A describes three models of the Worthington wagon drills — UMW-40, UMW-35, and UMW-30. Bulletin H-850-B71 describes a contractor's model 60-ft portable compressor.—**Worthington Pump & Machinery Corp.**, Construction Equipment Sales Division, Holyoke, Mass.

### CENTRIFUGAL PUMPS

Four-page flier describes the I-R cradle-mounted centrifugal pumps. The bulletin shows a sectional view of the pump with all its salient features pointed out and described. In addition, various types of drives are illustrated. The bulletin describes five models ranging in capacity from  $\frac{3}{4}$ - to 5-in. discharge with capacities to 1,600 gpm and heads to 250 ft.—**Ingersoll-Rand Co.**, 11 Broadway, New York 4, N. Y.



## How to Win an Uphill Battle

### **The tougher the terrain, the more you need a belt conveyor**

Take another look at that picture. It contains a story—and a moral.

The story is one with which you are all too familiar. Just where they want you to build a dam or handle some other large-size construction job, nature has fouled-up the terrain. It's full of hills and valleys, reached by tortuous roads—if any exist; if not, you have to *build* them.

Building roads to transport fill, aggregates and other bulk materials is so unnecessary. There's another way—a better way. Use a Belt Conveyor System . . . a Hewitt-Robins Belt Conveyor System.

Let's take the case illustrated as an example. Over that existing serpentine road, those materials would

have to travel many miles and negotiate two mountains in the process. But, when conveyed on 36" Hewitt-Robins Belt Conveyors, the distance becomes only half a mile, the climb less than 500 feet. And 1050 tons per hour of bulk material can be handled on a *continuous* basis—any given piece taking *less than 6 minutes* to complete the journey. The Conveyors in the picture tunnel under some highways, bridge others and jump across a ravine.

That's the story—now to the moral. Next time you have a construction job—on a straightaway or over troublesome terrain—ask Hewitt-Robins for recommendations on conveyerizing your bulk materials. You will be coming to a source of author-

ity. The rubber-covered Belt and the trough-shaped Idler (the bases of the Belt Conveyor) were both originated by Hewitt-Robins. So who could know more about them? Furthermore, no other company in the world manufactures both machinery *and belt*, so we . . . alone . . . are able *and willing* to assume undivided responsibility.

For a cost-analysis that will show you how to save time, trouble and money, send details—including topographic maps—to Contractor Service Dept., Hewitt-Robins Incorporated, Passaic, N. J.

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# A full Head of Steam

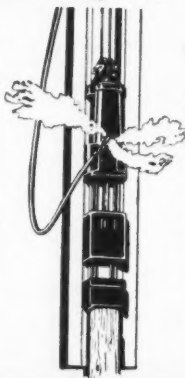
## in *30* minutes or less with a

### Cleaver-Brooks Mobile Steam Boiler

#### for pile-driving or extracting

Heavy-duty built to provide fast, dry steam — in dependable and ample supply — hot, dry steam that means less condensate at the hammer — smooth, powerful hammer action — steam that enables operators to drive more piling in less time — that cuts man hours on every job.

Self-contained and MOBILE — easily towed by truck or tractor from job to job — quickly moved from one location to another on the job. Haul it to the job (no crane needed to set it up) — hook up water and steam lines — start burner — and in 30 minutes or less you have a

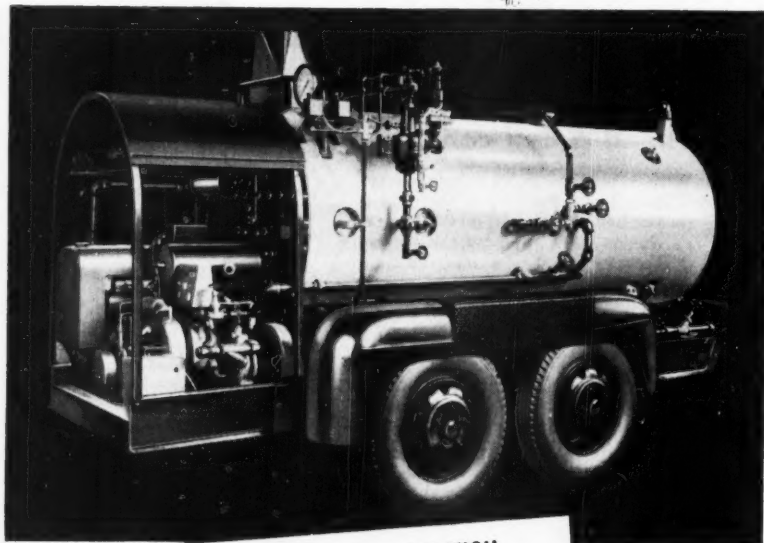


good "head of steam" — ready for work.

No need to bank fires at night — oil-fired — rapid starting — for an early start in the morning. Operates at 30% to 100% of rating without affecting its guaranteed efficiency of 80%.

All-year, all-season usefulness — besides pile-driving and extracting, use it for asphalt plant, ready-mix concrete plant, winter concrete operations and for thawing and miscellaneous heating. Write for bulletin.

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Produces 30% stronger concrete  
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Adjustable power  
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No wearing parts  
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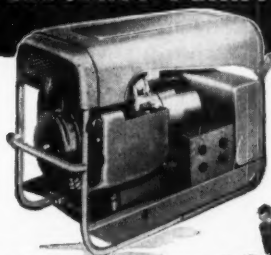
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**WELDING FITTINGS, STEEL FLANGES**—Seamless carbon-steel welding fittings and forged steel flanges are described in this 88-p catalog. In addition to presenting standard schedules with specifications, list prices, and sizes, the catalog provides data on dimensional tolerances, American standard flange facings, thread standards and practice, and other important data. The catalog also lists dimensions of welding fittings stocked in metals other than carbon steel.—Grinnell Co., Inc., Providence 1, R. I.

**FOLDING GOOSENECK TRAILER**

—Three sizes of trailers (20, 27, and 32 tons) are described in this 4-p bulletin. Featured in the folder is a description of the one-man-operated folding gooseneck which eliminates the need for ramps in loading the trailer. Also pictured is the lower platform height which provides better clearance for passing viaducts, high wires, and tunnels and bridges.—Martin Machine Co., Kewanee Co., Kewanee, Ill.

**USES OF AERIAL SURVEYS**

Typical uses and advantages of aerial surveys are illustrated and described in this 24-p catalog. Types of surveys listed include those for highway planning, flood control, city planning, railroads, and city and county maps. The catalog describes equipment used in preparing aerial surveys.—Aero Service Corp., 236 E. Courtland St., Philadelphia 20, Pa.

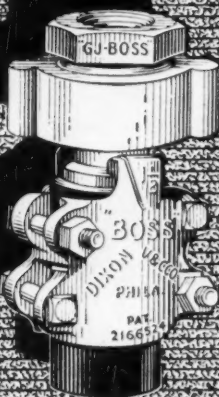
**MATERIALS-HANDLING GRABS**

—Hooks, tongs, grips, grip slings, piling pullers, and other types of grabs for handling loose bundles, heavy objects, or odd shapes are described in 24-p Bulletin 200B. General information, photographs, and specifications are listed for each type of equipment, as well as construction features, capacity ratings, and safety factors.—Downs Crane & Hoist Co., 540 W. Vernon Ave., Los Angeles 37, Calif.

**WELLPOINT SYSTEMS**—New catalog describes a line of wellpoint equipment. A feature of the catalog is a large number of illustrations and descriptions of several typical dewatering jobs. The booklet stresses the Stang methods and equipment used in small and large projects.—John W. Stang Corp., 8221 Atlantic Ave., Bell, Calif.

**STUD WELDING**—Eleven different construction applications of stud welding are illustrated in a new 4-p folder. Uses shown include installation of roofing, siding, windows, and decorative panels; insulation; electrical equipment; and various types of reinforcing for concrete and gunite applications.—Nelson Stud Welding Division, Morton Gregory Corp., Lorain, Ohio.

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**\*"GJ-BOSS"**  
*Ground joint female coupling*  
**Style X-34**

The original washerless hose coupling... product of true perfection in design and construction. Provides unequalled convenience, durability and safety on all high or low pressure lines. Cadmium plated—rustproof.

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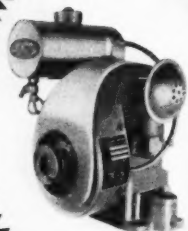
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• Insist on Lauson — the engine that's first in quality!

Here are just a few of the superior construction features which make Lauson the Long-Life engine: Connecting rods have replaceable crank-pin bearing liners.

• Precision ball bearings on both ends of crankshaft.

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• Automotive-type float feed carburetor.

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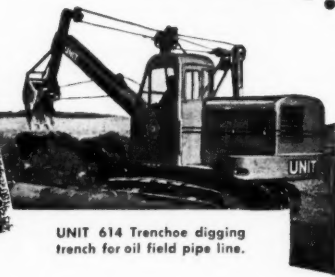
**PRECISION LATHES**—South Bend's Light Ten lathes are illustrated and described in Catalog L-10. Complete specifications and prices are listed, as are attachments and accessories for use with the lathes.—**South Bend Lathe Works, 425 E. Madison St., South Bend 22, Ind.**

**HARD-FACING ELECTRODES**—Alloys for rebuilding and hard-facing are listed in this 8-p catalog. The catalog describes each material in detail, listing its properties, welding procedure for its use, typical applications, and sizes in which it is furnished.—**Alloy Rods Co., 7105 W. Market St., York, Pa.**

**VARIABLE-WEIGHT ROLLERS**—Feature of this catalog (16 pp) is a "How to Buy-How to Use" section showing how to select the right roller model for the job. Each new model roller is treated separately with matching illustrations to demonstrate its versatility and limitations. Models listed range in working weights to 12 tons. Considerable space is devoted to a non-technical discussion of the 4-speed transmission. The catalog is designed as a source book of ready reference material on road equipment, especially as it relates to 3-wheel rollers.—**The Buffalo-Springfield Roller Co., Springfield, Ohio.**

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MOBILE OR CRAWLER  
TRENCHER



UNIT 614 Trencher digging trench for oil field pipe line.

Digs trenches for pipe ... sewer and water connections ... Footings ... Basements ... Culverts ... and a thousand other excavating jobs.

Trims corners, neatly and squarely ... cuts a level floor ... delivers straight vertical side walls without additional labor of hand trimming.

Powerful ... compact ... perfectly balanced ... every UNIT is designed to meet the most rigid demands.

Trouble-free, economical performance built into every machine ... Service and maintenance needs are negligible.

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1/2 and 3/4 Yard  
EXCAVATORS  
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CRANES up  
to 15 TONS

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Convertible to  
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UNIT 357 Mobile Trencher. Self-propelled ... rides on rubber ... goes anywhere ... digs deep. Convertible.

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CRANES • TRENCHERS • MAGNETS

**BRICK AND TILE CONSTRUCTION**—The Structural Clay Products Institute has inaugurated a monthly information service to further better masonry structures. The first four issues cover cold-weather masonry construction; efflorescence; construction of watertight masonry walls; and painting brick and tile walls.—**Structural Clay Products Institute, 1520 Eighteenth St., N. W., Washington 6, D. C.**

**CONVEYOR MAGAZINE** — Copies of The S-A Conveyor are available free to those interested in conveyor operation. Published quarterly, this magazine contains interesting articles dealing with job applications of various types of conveyors. The magazine also contains information on proper handling and maintenance of these units.—**Stephens-Adamson Mfg. Co., Aurora, Ill.**

**FLEXIBLE TUBING**—Specifications application data, engineering tables, sizes, and other descriptive matter on Spiratube flexible tubing are contained in Catalog 5-4. Features of Spiratube discussed in detail in the catalog include wear and heat-resistance, portability, retractability, and ease of assembly.—**The Flexible Tubing Corp., Branford, Conn.**

**SILICA GRAPHITE PAINT**—Three new bulletins describe flake silica graphite paint and primer for protecting metal structures. These bulletins (V-53, V-55, and V-56) describe silica graphite completely, listing its principal features and explaining how it protects both exterior and interior surfaces.—**Joseph Dixon Crucible Co., Paint Sales Div., Jersey City 3, N. J.**

**WARM-AIR PANEL HEATING**—The Flexicore split system of warm-air panel heating is described in a new folder. This system features the use of Flexicore structural floor members as both warm-air ducts and a panel heating unit. The folder features large drawings indicating complete installation and flow path of warm air through the Flexicore units.—**The Flexicore Co., Inc., 1932 E. Monument Ave., Dayton 1, Ohio.**

**MEMBRANE CURING COMPOUNDS**—Twelve advantages claimed for Permite concrete-curing compounds are listed in this 4-p bulletin. When sprayed on to a concrete surface, Permite is said to form an impervious film which seals in mixing water for proper curing. The bulletin describes two types of Permite—one for horizontal surfaces and vertical surfaces below grade; the other for vertical surfaces where non-discoloration is an important factor.—**Aluminum Industries, Inc., 2438 Beekman St., Cincinnati 25, Ohio.**











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Chevrolet trucks outsell all others. In every postwar year truck users have bought more Chevrolets than any other make—proof of the owner satisfaction they have earned throughout the years.

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The Chevrolet truck line is the very lowest priced line in the field—saves on initial cost. What's more P•L trucks give owners dollar and cents savings in maintenance and operation.



#### UNIVERSAL TESTING MACHINE

—Low-cost universal testing machine has a range of 60,000 lb. A 4-p folder describing the Sonntag unit lists several design features as well as complete specifications. A line drawing indicates location of important component parts.—**The Baldwin Locomotive Works, Testing Equipment Dept., Philadelphia 42, Pa.**

#### METAL DRAINAGE STRUCTURES

—Three new bulletins released by Armco describe various types of metal drainage structures. One bulletin, 24 pp in length, describes the primary advantages of perforated pipe and gives recommended installation methods. It also describes the advantages of controlling ground water. The second bulletin describes Armco and sections designed to provide increased culvert efficiency; to match modern road design; and to provide simple, speedy installation. The third bulletin describes strength advantages of Armco metal drainage structures. A listing outlines types suitable for various installations and kinds of service.—**Armco Drainage & Metal Products, Inc., Middletown, Ohio.**

**ALLOY-STEEL TOOLS**—Safe-T-Kut tools listed in Bulletin 2-SK include hand chisels, pneumatic and electric hammer chisels, center punches, paving breaker steels, and back-out punches. The bulletin describes the Delsteel alloy from which the tools are produced, inspection procedures, and special designs.—**Delaware Tool Steel Corp., Wilmington, Del.**

**TRANSLUCENT BUILDING PANELS**—Corrugated plastic panels for use in construction are described in a 4-color folder, illustrating colors in which the Corrolux panels are produced. Text describes principal features of the panels, and illustrations show several typical uses.—**Corrolux Corp., P. O. Box 6524, Houston 5, Tex.**

**ALLIS-CHALMERS TRACTORS**—Pocket-size catalog (20 pp) discusses the importance of using equipment designed to fit job requirements. The catalog contains specifications and a brief description of each A-C power unit, wheel tractor, and crawler tractor.—**Allis-Chalmers Mfg. Co., Tractor Division, Box 512, Milwaukee, Wis.**

**POWER TOOLS**—Catalog (36 pp) describes power tools for wood, metal, and plastics. Included are band saws, radial and tilting-arbor saws, drill presses, jointers, lathes and shapers, air feeds, surfacers, and flexible-shaft machines. Specifications and operating conditions for each machine are listed.—**Walker-Turner Div., Kearny & Trecker Corp., Plainfield, N. J.**

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• It pays to service your Tackle Blocks in the off-season—check the Sheaves, Pins, Bushings, and Lubrication.

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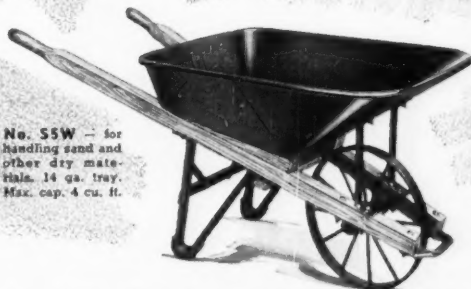
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No. S5W — for  
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14 ga. tray.  
Max. cap. 4 cu. ft.

You'll like these new, lightweight, easy-wheeling Sterlings, designed for faster material transport service. Famous Sterling balanced construction puts 80% of the load on the wheel . . . only 20% on operator. Equipped with long wood handles, formed to fit operator's hands. Steel channel legs and reinforcements are just the right height. Means less stoop for operator and greater leg clearance. Steel wheel, roller bearing wheel with pneumatic tire or zero pressure cushion type wheel, can be furnished. Write for new Wheelbarrow Catalog.

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- ✓ For belts  $\frac{3}{8}$ " to  $\frac{1}{2}$ " thick.
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- ✓ Strong, durable . . . strain is distributed uniformly across joint.

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Whether you are concerned with moving cottages or city blocks, you will want to read this fascinating story of sixty years with the E. W. LaPlante Co. See how one of the nation's outstanding organizations of moving engineers has "juggled" millions of tons—safely!

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2325 EAST 46TH ST., INDIANAPOLIS, IND.

**NO JOB TOO BIG . . . NO PROBLEM TOO TOUGH!**

### TUBULAR-STEEL SCAFFOLDING

—Eight-page catalog carries illustrations of a complete line of tubular-steel scaffolding and equipment. Included are drawings and complete specifications on various types of end frames for tower scaffolding and a broad range of accessories, including ladders, ladder-jacks, scaffold brackets, sidewalk bridges, and plasterer's scaffolding. Photographs of several installations are included. —Bil-Jax, Inc., Archibold, Ohio.

### LINEMEN'S SAFETY EQUIPMENT

—Folder describing general line of safety equipment features a description of an adjustable climber with replaceable gaff. Made of aluminum alloy, it has steel gaffs, rings, and locking screws.—W. M. Bashlin Co., Grove City, Pa.

### CATERPILLAR CATALOGS

—Five new catalogs are available from Caterpillar. Catalog 12597 (36 pp) contains information on the complete line of Caterpillar equipment including several new machines which have been added recently. Form 12857 is a broadside describing the Model 40 scraper. Form 12683 is a descriptive catalog covering the use of diesel tractors. Form 12679 is a descriptive catalog explaining the use of Caterpillar engines on construction jobs. Form 12809 is a booklet describing irrigation, dredge, water works, repressuring, and water-supply pumps driven by diesel engines.—Caterpillar Tractor Co., Peoria 8, Ill.

### SOIL STABILIZERS

—Job-data folder (4 pp) describes applications of the P&H single-pass soil stabilizers. The folder covers the use of the machine in road and airport work in many states and foreign countries. Feature of the folder is a large cutaway drawing explaining operation of the machine.—Harnischfeger Corp., Stabilizer Div., 4494 W. National Ave., Milwaukee 14, Wis.

### STEEL WATER LINES

—Third annual report (8 pp) carries construction details on principal steel water lines laid by Dresser during the last year. The report carries job details for each line, and contains information on latest developments in waterline construction methods and materials.—Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.

### CONCRETE CUTTING

—Treatise on subject of cutting concrete with diamond abrasive wheels has been published in catalog form. The treatise discusses development of this type of equipment, the various Felker Di-Met concrete-cutting machines, advantages claimed for concrete cutting, methods of cutting concrete, and recommended applications. The bulletin is thoroughly illustrated with job photographs.—Felker Mfg. Co., Torrance, Calif.

## MONOTUBE STEEL PILES save time, cut costs on "hard-to-get-to" job!

**Y**OU'LL get new ideas about the savings and conveniences with Monotubes from the job pictured here.

It's a foundation for an overpass to carry coal cars from a strip mine. Naturally, it has to be strong and rigid—to withstand the multiple-ton weights of loaded coal cars. Construction was wanted quickly.

### FAST "DRIVING" RECORD!

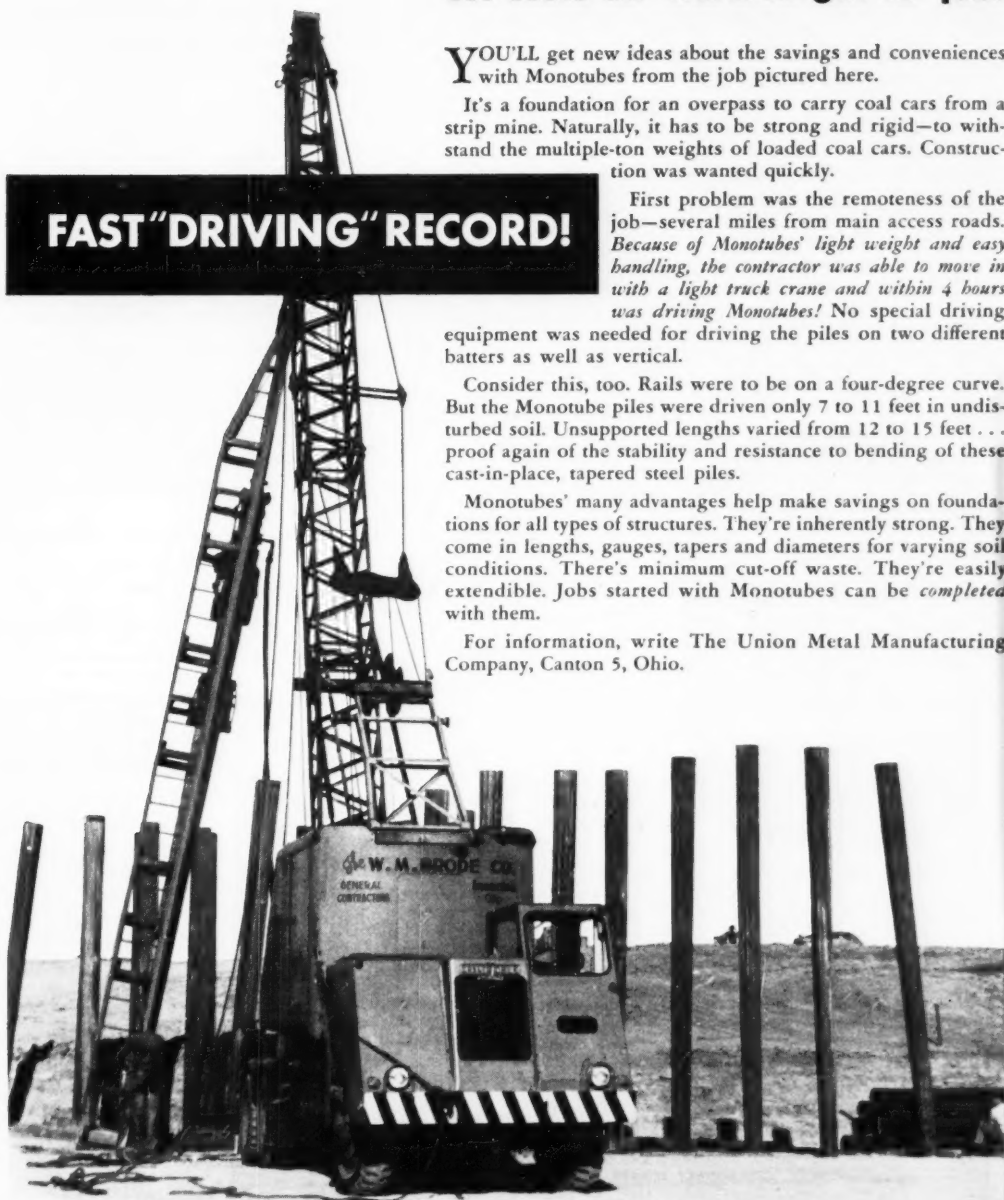
First problem was the remoteness of the job—several miles from main access roads. *Because of Monotubes' light weight and easy handling, the contractor was able to move in with a light truck crane and within 4 hours was driving Monotubes!* No special driving

equipment was needed for driving the piles on two different batters as well as vertical.

Consider this, too. Rails were to be on a four-degree curve. But the Monotube piles were driven only 7 to 11 feet in undisturbed soil. Unsupported lengths varied from 12 to 15 feet... proof again of the stability and resistance to bending of these cast-in-place, tapered steel piles.

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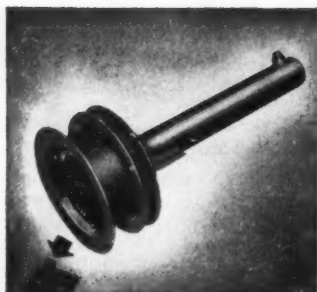
For information, write The Union Metal Manufacturing Company, Canton 5, Ohio.



Overpass construction at Cadiz, Ohio.  
Contractor: The W. M. Brode Company,  
Newcomerstown, Ohio.

## UNION METAL

*Monotube Foundation Piles*



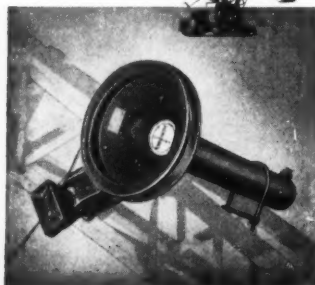
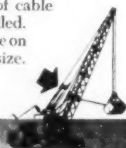
### RUD-O-MATIC MAGNET REEL-TAGLINE COMBINATION

Rud-O-Matic Combination Magnet Reel-Tagline saves costly electric cable on overhead and boom crane magnet pick-up jobs. Steel tagline cable takes the load. Protective slack is maintained on electric cable. Models to fit your need.

Boom Crane or  
Overhead Crane  
Clam Shell Bucket  
or Magnet Pick-Up  
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TAGLINE CONTROL  
is your  
answer!

### RUD-O-MATIC TAGLINE

holds the bucket steady at any angle of the boom. Heavy duty torsion coil spring assures constant tension at all times, at any length of cable run-out. Easily installed. Interchangeable for use on equipment of similar size. 8 models for various bucket sizes.



**McCAFFREY-RUDDOCK Tagline CORP.**  
2131 EAST 25th STREET • LOS ANGELES, CALIFORNIA

**ROAD-BUILDING EQUIPMENT**—Equipment listed in the ApSCO catalog includes wideners, base pavers, trench rollers and widening chippers. Detailed specifications are provided for each unit in the ApSCO line. Text and photographs are used to describe principal features of the equipment and to show how the equipment is used.—**All-Purpose Spreader Co., Elyria, Ohio.**

**SIDE-LIFT TRAVELOADER**—Hydraulically controlled side-loading Traveloader is designed to handle lengthy materials in narrow passageways. It can also be used as a yard crane, spooled-cable reeler, strip-steel carrier, and a side-loading fork-lift truck. A catalog (12 pp) is now available containing complete information on its construction and operation. This catalog shows the Lull unit in use on a variety of jobs; shows a bird's-eye view indicating its over-all appearance; and lists complete specifications.—**Lull Mfg. Co., 3612 E. 44th St., Minneapolis 6, Minn.**

**STRUCTURAL STEEL**—Factual information on structural steel is interestingly presented in this 64-p booklet. The booklet tells what structural steel is, describes the shapes in which it is available, and lists its advantages and physical properties. The booklet contains a section on steel fabrication listing several types of structures built of steel. Also listed are winners of the AISC annual bridge awards. The booklet is thoroughly illustrated with large, interesting photographs of steel structures both in the construction stage, and as finished products.—**American Institute of Steel Construction, Inc., 101 Park Ave., New York 17, N. Y.**

**GLASS-BLOCK INSTALLATION**—Illustrated description of how to install glass-block panels makes up this Insulux folder. The bulletin tells how to install small panels without wall ties, expansion joints, wall anchors, or calking (except at head). Details are provided for installation in wood frame or brick veneer frames.—**American Structural Products Co., Subs. of Owens-Illinois Glass Co., Toledo 1, Ohio.**

**PAVING MATERIALS MANUAL**—The first portion of this 50-p manual describes operations and pavement types in which Tarvia road tar and Tarvia-Lithic bituminous concrete are used. Methods of construction are described in general terms. Second portion describes manner in which Barrett paving materials may be utilized in the repair and maintenance of various types of pavement.—**The Barrett Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.**

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**FOR CLEANING BRIDGES — WATER  
TOWERS — STRUCTURAL STEEL**

Many contractors use Ruemelin Blast Generators for cleaning steel work to remove rust, paint and scale before repainting. These machines are also used to remove laitance from cement wherever concrete construction is in progress. A wet adapting nozzle can be furnished to convert dry machines to wet type of operation. Built in several sizes.



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Manufacturers and Engineers  
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PUMPS**

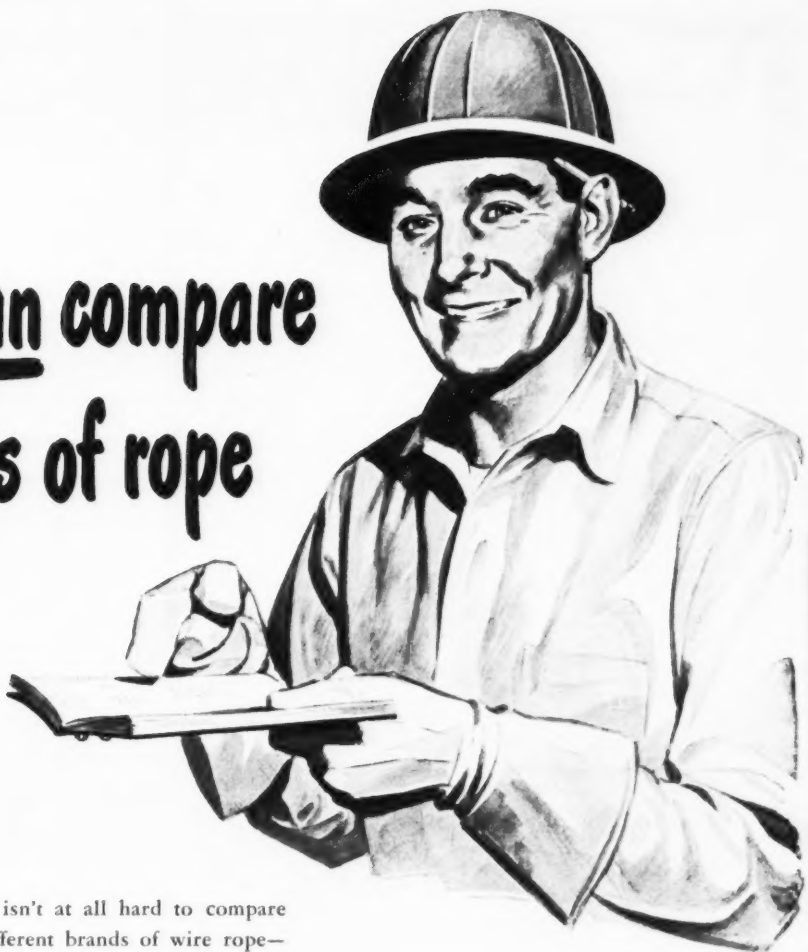
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It isn't at all hard to compare different brands of wire rope—not if you keep a simple system of records.

These records should, of course, show the work totals done by your wire ropes during their life-time. Pick as a basis the unit of work most applicable to your line of business—a ton-mile, for instance, in oil-country drilling; a cubic yard of

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Bethlehem has always advocated the keeping of such records. One reason (we admit it freely) is that Bethlehem wire rope is an *economical* rope, and your records will prove it. We welcome comparisons with anybody's product.



LET YOUR RECORDS  
TELL YOU!

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On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation  
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in  
Dredging

it's the solids pumped  
--- that counts!

## Eagle "Swintek" Dredging Ladders get the Solids!

YOU can't sell water—it costs money to pump it—it's the sand and gravel intake that counts. Put an Eagle "Swintek" unit on your dredge and watch the ratio of solids to water zoom up! The digging chain passes over an arcuate track at the end of the dredge ladder, hugging the intake nozzle, shielding it against boulders and logs—prevents clogging and abuse to pumps. The cutters chop loose impacted aggregate and get it into suspension so the pump can "do its stuff." Clay and silt are churned away from pumping zone. An even flow of material to shore plant is assured.

Above: E. T. Slider Co., Louisville, Ky., Ohio River dredge No. 3 equipped with 15—75 heavy duty "Swintek" Double side braced for heavy river bar dredging conditions. This highly successful producer has used "Swinteks" for nearly 20 years.

It is not uncommon to increase dredge output 400% or more. Many dredging operations that were in the red have been put into the profit column for keeps by installation of a "Swintek." CHALLENGE that statement—we would like to prove it to you. See an installation—send for Catalog 745

At Left: Special lightweight 60' Eagle ladder increased output 400% for Penn Jersey Sand & Gravel Co., Bridgeport, N. J.—average over 150-tons per hour, using 6 pump.

By installing an 8-45 Heavy Duty Eagle "Swintek," Bowersock Sand Co., Lawrence Kan., doubled production, cut through clay strata to reach virgin sand, keep rocks out of line. "Sure they did not buy it sooner."

SINCE 1872  
Progress...Service

"SWINTEK" DREDGE LADDERS — SCREW WASHERS  
LOG WASHERS — DEHYDRATORS — SAND TANKS  
CLASSIFIERS

**EAGLE IRON WORKS**

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**WELLPOINT  
SYSTEM**

The Stang System has proved its efficiency and economy on both large and small jobs all over the United States. Stang engineering and supervision in planning, installation and operation insures a DRY JOB at all times.

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2 Broadway 2123 S. 56th St. 8221 Atlantic Ave.  
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For  
KNOW-HOW  
ENGINEERING  
SUPERVISION  
EQUIPMENT  
to keep jobs  
DRY

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(Classified Advertising)

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BUSINESS: USED OR RESALE

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- 3—Allis-Chalmers Model HD-19 Crawler Tractors with Garwood cable bulldozers.
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ALL IN EXCELLENT CONDITION; RDS REBUILT

**EDWARD EHRBAR, INC.**

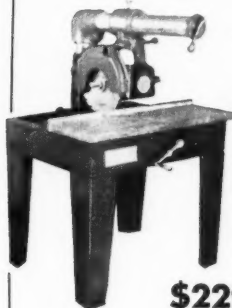
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(once in a life-time)



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- Was \$410
- Now

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**STODDARD MACHINERY CO.**

317 Court Ave., Des Moines, Iowa  
Phone 8-0123

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Equipment in excellent condition and can be purchased for little more than the price of one new DW10 and Scraper

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"CATERPILLAR" DISTRIBUTORS  
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**FACTORY**  
*Surplus*  
**SALE!**  
PORTABLE  
MULTI-USE  
**POWER  
SAW**



**SAVE**  
**\$300**  
**WAS \$385.00**  
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A1. 1281  
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One Pease 54 inch No. 10 Blueprint Machine complete with dryer. In good operating condition. Write  
FS6873 Construction Methods & Equipment  
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Specialties & Services for  
the Construction Industry

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VALVES

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A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—solid 1250 lbs. per sq. ft. hydrostatic pressure. Cuts cost; applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.

HAYNES PRODUCTS CO., OMAHA 3, NEBR.

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CONSTRUCTION  
BOYCE COMPANY**

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EMPLOYMENT . . . EQUIPMENT  
BUSINESS . . .  
**OPPORTUNITIES**  
Whatever your need—  
think "SEARCHLIGHT" FIRST

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- Completely cab-controlled blade travel from 90° on one side to 90° on the other
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- Sliding moldboard
- High working clearances, front and rear
- Mechanical steering with hydraulic booster
- Interchangeable wheels

An almost impassable road in Lamar County, Alabama, becomes a two-lane rural highway with the help of a WARCO 100 H. P. Motor Grader. Stubborn Alabama red clay was quickly put in place as the operator bank-sloped, ditched and shaped in exceptionally fast working time.



High-angle bank cutting or routine grading . . . whatever assignment you give your WARCO Motor Grader, it continues to deliver an amazingly high productive factor. Why? Because its finger-tip hydraulic controls and speedily positioned blade help to turn out more work in fewer hours . . . and every foot it travels is a foot it works. That's why you can bank on the WARCO high productive factor.

See the WARCO . . . compare its construction, operation, performance . . . then you'll decide that your next motor grader must be a WARCO.

**4D-100 WARCO Heavy Duty 100 H. P. Motor Grader**  
**4D-76 WARCO General Duty 76 H. P. Motor Grader**

**W. A. RIDDELL CORPORATION**

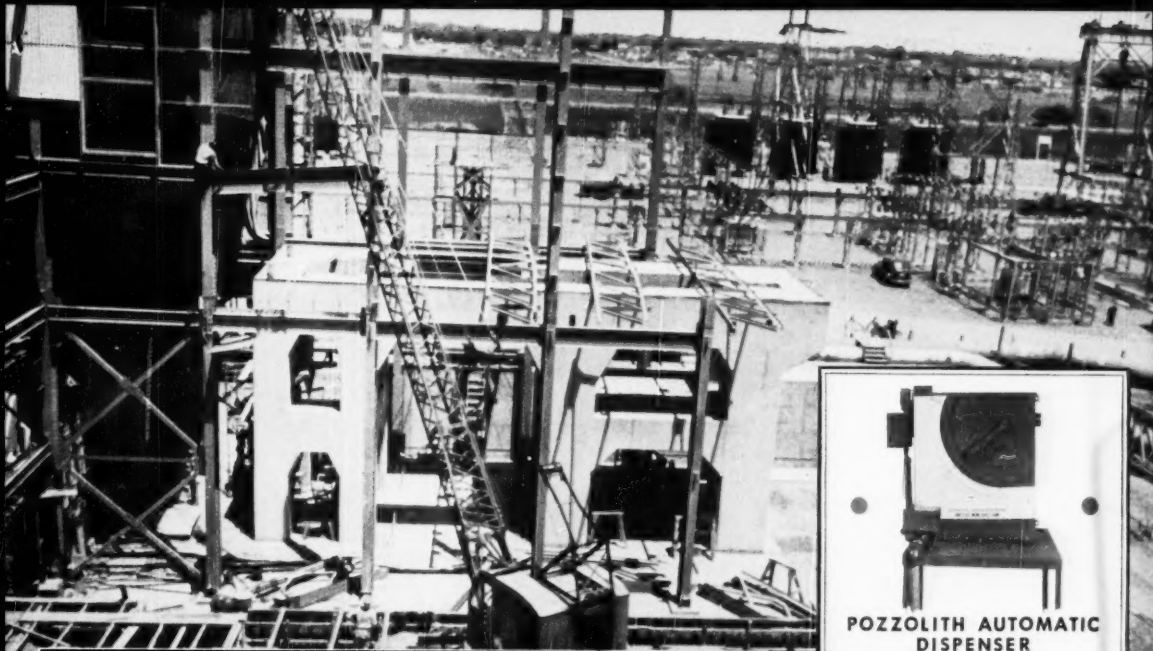
BUCYRUS, OHIO

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# Pedestal for Arizona's Largest Turbo-Generator Produced In One Continuous Pour with . . .



Turbo-Generator Pedestal, Central Arizona Power & Light Co., Phoenix, Arizona. Power Company's men in charge of job—Mr. James A. Johnson, Construction Superintendent, Mr. Frank H. Edson, Asst. Construction Superintendent, and Elvin M. Parker, Job Foreman. Pozzolith Ready-Mixed Concrete supplied by Superior Sand & Gravel Co., Phoenix, Arizona.

## POZZOLITH READY-MIXED CONCRETE

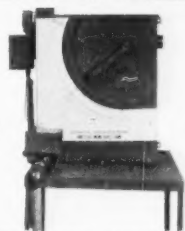
Concrete of ideal placeability, readily mobile and with the correct cohesiveness essential to the successful pouring of this monolithic turbo-generator pedestal, was produced with Pozzolith by Superior Sand and Gravel Co., Arizona's leading ready-mixed company.

In addition to easy placeability and assured strength, Pozzolith Ready Mixed Concrete provides these advantages:

1. EASY, ACCURATE CONTROL
2. MINIMIZED SHRINKAGE
3. REDUCED PERMEABILITY
4. GOOD APPEARANCE
5. ECONOMY

Over 400 leading ready-mixed plants in all parts of the country are producing Pozzolith Concrete — and many top design engineers are specifying it — for these reasons.

*Write for full information.*



### POZZOLITH AUTOMATIC DISPENSER

Operator delivers the correct amount of Pozzolith, in liquid form, required for a batch, by simply setting the control dial and opening valve.

OVER 400 LEADING READY-MIXED PLANTS ARE NOW EQUIPPED WITH THIS DEVICE . . .

#### WHY?

Because a producer can, at lower cost:

1. Produce concrete with reduced permeability . . . with normal Portland cement.
2. Produce high-early strength concrete . . . with normal Portland cement.
3. Produce air entrained concrete without strength loss . . . with normal Portland cement.
4. Produce all of the above properties out of one cement bin . . . with normal Portland cement — stepping up production, reducing inconvenience in handling and cutting costs.

*In normal mixes, concrete of any given durability, strength and workability, is produced more economically with Pozzolith than with any other material on the market, added at the mixer or inter-ground.*

**the MASTER BUILDERS to**

CLEVELAND 3, OHIO

TORONTO, ONTARIO



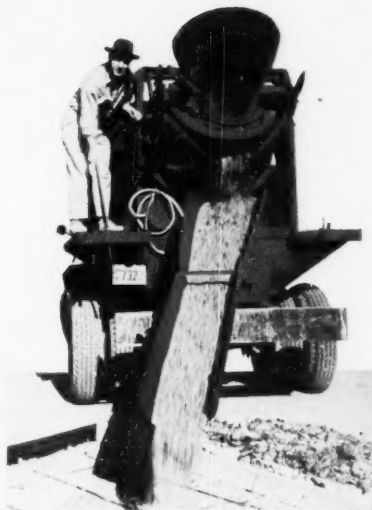
# BLUE BRUTE USERS AGREE: "It's a Great Line of Mixers!"



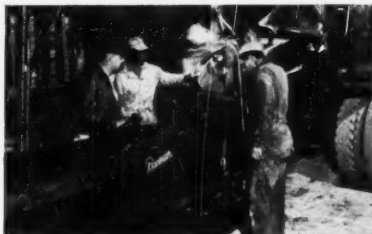
**FOR CENTRAL MIXING**  
This modern plant of the Clark Certified Concrete Company, Inc., of Baltimore, Md., produced 125,000 yds. of pre-mixed concrete during the past year. Vice-President Duncan writes: "Your Blue Brute 34-S Stationary Mixer has proven entirely satisfactory. Maintenance costs have been practically nothing."



**FOR PORTABLE MIXING.** Le Roy W. Vival, chief engineer of the O'Sullivan Rubber Corporation, Winchester, Va., reports: "We are extremely gratified by our Blue Brute 3 1/2 Tilting Mixer, which has had two years of constant, severe use. It is extremely mobile, well constructed and performs excellently. Long exposure has not decreased its efficiency. The mixing cycle is fast and the mix consistently uniform. It is a pleasure to endorse and recommend this equipment."



**FOR TRANSIT MIXING.** President Bob McCorkle of the Abilene, Texas, Concrete Company, gives his reasons for re-ordering Blue Brute Hi-Up Truck Mixers: "We have compared competitive makes on our jobs and find your Hi-Ups best in every way. Maintenance costs have been negligible. Just purchased your first chain-drive Hi-Up and find it even better than the older machines — faster charging and discharging, easier to maintain and smoother running."



**FOR PLACING.** In building the Washburn vehicular tunnel under the Houston, Texas, ship channel, the "Trench method" of construction was used. The last yard or two of concrete placed in each of the section joints had to be placed straight upwards — a tricky pouring problem. Merritt-Chapman & Scott Corporation reports an easy solution was found with the aid of a Blue Brute Pneumatic Placer, which performed excellently.

Yes, among Blue Brute owners it's a never-ending story of more concrete at lower cost, trouble-free operation, time and money saved in every detail of mixing operations. Why not look into this proof that *there's more worth in Worthington?* See your nearby Worthington-Blue Brute Distributor, or write for bulletins on mixer types in which you're interested.

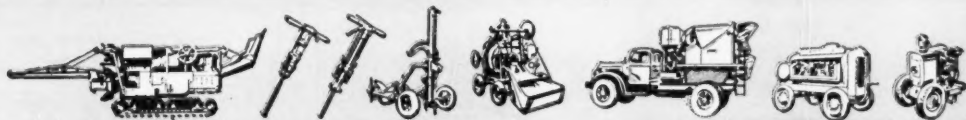


## BUY BLUE BRUTES

Worthington Pump and Machinery Corporation  
Construction Equipment Department  
Harrison, New Jersey

Distributors In All Principal Cities

### WORTHINGTON



**IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB**